

HISTORICAL GEOGRAPHY OF THE
MACKENZIE RIVER VALLEY 1750 - 1850

By

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INTRODUCTION

For geographers will view that the character of place, the
science of geography, evolves through a time continuum. In the
past, and in the future, the relationship between the physical
world and the human world is as relevant as it is in the present. For the
past, the world is as it was, and the world is as it is, and the world
is as it will be. The world is as it is, and the world is as it
will be. The world is as it is, and the world is as it will be.
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This thesis is an historical geography of the Hackensack River
valley covering the century between 1750 and 1850. At the beginning
of this period the occupancy of the valley by the indigenous
population represented the history between 1750 and 1850 as it had
evolved from the time of the first settlement.

INTRODUCTION

It was a hostile environment to which there had been only a partial
response. Near the end of the eighteenth century an entirely new
culture with quite different ideas about the organization of the
land and the life of the community had been introduced into the valley.
The new culture was based on the principles of the new world, and the
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INTRODUCTION

Few geographers will deny that the character of place, the essence of geography, evolves through a time continuum. Perhaps the majority have interested themselves with geography of the present reaching into the past only insofar as it seems necessary. On the other hand, there are those geographers who are curious about what places were like at other intervals before the present. The field of historical geography promotes and attempts to satisfy this kind of curiosity.

This thesis is an historical geography of the Mackenzie River valley covering the century between 1750 and 1850. At the beginning of this period the occupance of the valley by the aboriginal population represented the harmony between man and land as it had evolved from the interaction of nature's challenges and man's ingenuity. It was a hostile environment to which there had been only a primitive response. Near the end of the eighteenth century an entirely new culture with quite different ideas about the exploitation of the natural wealth of the country intruded itself upon the existing way of life. Fur traders from Canada had at their disposal many articles of European manufacture that immediately fascinated the natives and created in them a desire that could be satisfied by the exchange of these items for a few animal skins. The traders were also explorers and rapidly extended their system and influence throughout the valley. This type of contact was also supported by geographical exploration intended only for accurate mapping of the main topographic features of the land. Within a very few years the aboriginal way of life was transformed. The thesis attempts to describe and assess the character

of the occupance of the Mackenzie valley before, during, and after the advent of the fur trade.

The Mackenzie valley, which includes the entire drainage basin downstream from Great Slave Lake, is a very large one; its area is about equal to that of the Canadian province of British Columbia, or nearly four times the area of Great Britain. The straight-line distance from the southern divide to the Arctic Ocean is about 1000 miles, and the region is 400 to 500 miles broad. Great distances and vast areas are, therefore, its key characteristics. The geographic location of the valley, lying between 58°N and $68^{\circ}30'\text{N}$ in the northwestern part of the continent, marks it as a northern land. This fact may be found at the root of practically all facets of the regional personality.

Most surely the stamp of northness is in the physical geography of the valley and because the natural setting of the land offered both opportunity and limitations to human activity during the century investigated, it is fitting that the thesis should first be concerned with this aspect. The physical geography has been discussed in perhaps more detail than is absolutely necessary to support the main aim of the thesis - to demonstrate the changes in the way of life up to 1850. However, this emphasis is necessary for two reasons: first, the elements of the natural environment are abiding characteristics that have remained essentially unchanged to the present because the impact of modern technology has, as yet, done little to modify them directly - the region still looks the same; second, a complete background of the physical make-up of the Mackenzie valley is necessary for anyone who wishes to follow the

trends of development beyond 1850 or who may be stimulated by this study to follow the rapid pace of change that is now beginning in Canada's far northwest. The underlying framework of the country has been examined in the chapter on Bedrock, Structure, and Topography. Until relatively recently these features were known only in the broadest sense. Now, however, new topographic mapping accelerated by complete coverage of aerial photographs has permitted a more careful analysis of the land surface and has resulted in the generalizations shown on the Physiographic Diagram (Map I). The topography, once known, has been related where possible to the bedrock geology but more particularly to the structure of the rocks which in the western half of the region is made up of broad, gentle folds, and in the eastern half nearly flat-lying sedimentary strata. Across the land flows the Mackenzie River neatly dividing the basin and separating the western mountains from the eastern plain. Some consideration is given to the nature of the tributaries, especially the fast-flowing, youthful streams from the west that have cut deep valleys and contributed to the ruggedness of the mountains. These rivers, the chief of which is the Liard River, are the access routes to the west that controlled Indian movements and attracted the exploring fur traders. Even the few, less vigorous streams which drain the plains had their influence on both the native and white populations.

The gross topography in the region survived the onslaught of the Pleistocene ice sheets but glacial sculpturing contributed to the present jagged outline of the mountain province. Elsewhere continental ice swept weathered rock from some areas and deposited

it in others so that parts of the plain now wear a heavy mantle of drift. The events of this period in the history of the earth affected the nature of the present land surface particularly in the formation of lakes, and both new and abandoned drainage channels. These water features have long been natural attractions for native peoples because they represent source areas for food, or transportation links influencing migrations. The development of soil subsequent to glaciation has been important to man only indirectly through the association of soil, vegetation, and animal life upon which both Indians and Europeans depended. For this reason soils have been briefly described.

The aboriginal population of the Mackenzie valley both before and after the contact with the European culture were very much influenced, if not controlled, by the physical environment, and the most compelling element of the environment was the climate. The pattern of long, cold winter with Arctic and Sub-Arctic darkness is in marked contrast with the short, surprisingly warm summer when daylight is continuous or nearly so. This alone was directly responsible for a definite seasonal activity among the natives. Temperature changes forced adaptations of shelter and clothing. Drawing on the faunal world, which itself was biologically in harmony with the climate, native man satisfied his wants, but to do this, he had to respond to the seasonal habits of the animals he hunted. The tempo of his life was slowed in the depths of winter, and quickened during the period of high sun. The transition seasons brought adjustments designed to meet the particular oncoming season; canoes and fishing gear were made in spring for summer use, or food and

clothing were gathered and prepared in autumn for winter needs. Travel to desirable hunting or fishing grounds had to take account of the period of immobility occasioned by break-up and freeze-up of the lakes and rivers. Even the precipitation regime, particularly the amount and persistence of the snow cover, influenced the success of native hunters.

White men in this same environment bent their ways to nature. They too worked with the seasons confining most of their transportation and travel to the period of open water, engaging in modest agricultural activity during summer, cutting wood for winter fuel, and repairing equipment or making trade goods during wintertime. Moreover, it was to harvest the fur pelts of animals adapted to cold climates, that the whites came in the first place, and they remained in the northwest by borrowing many of the ways of the native Indian.

No quantitative records of the climate during the early historical period exist. Although a thorough climatic study of the recent recorded data would undoubtedly show fluctuations, it is assumed that these records give a climatic picture which is not greatly different from that which existed between 1750 and 1850. For this reason, current data are presented to represent conditions as they probably existed during the historical past.

The distribution pattern of vegetation types is largely the product of topographic and climatic influences, and in a sense represents a summation of the elements of the natural environment. Most significant in the pattern is the boundary between forested and non-forested land because the Indian people confined most of their activities to the forested part of the region. Within the

forest, they had a constant supply of wood from which they fashioned many implements and utensils, but more important, the forest constituted an inexhaustible supply of fuel, and it was the lack of this item on the barrens that limited Indian life mainly to the forested zones. The character and composition of the forests in the Mackenzie region had some effect upon the native life. In the open Sub-Arctic Forest - Tundra Transition (most of the region) patches of stunted trees are interspersed with bogs and mossy meadows. Overland travel was best accomplished in these areas in winter when the bogs were frozen, but in summer, journeys mainly followed the water courses to avoid soft ground. Campsites always were in the wood thickets. At the south end of the region in the Boreal Forest the extensive tree cover imposed more restrictions on travel because the dense forest confined Indian settlement closer to the rivers and lakes.

Related to the vegetation pattern is the distribution of mammals; they were in the first instance the objects of Indian hunting primarily to supply food and clothing. The larger beasts like caribou, moose, deer or even mountain sheep were the best sources of food by virtue of their great size, and their hides, larger than other animals, possessed properties suitable for making clothes. Many other items like bone implements, thread and rope-lines were bi-products of this hunt. In some quarters the advantages of size of skin and quantity of meat from large animals were outweighed by small animals like rabbits which when they occurred in great numbers were easily caught. After the introduction of the fur trade the natives learned to hunt many other beasts that were formerly of little or no significance in their way of life. A portion of the thesis

deals with the characteristics and distribution of these mammals as background for understanding the native economy and its subsequent modification.

The remaining elements of the faunal world, fishes and birds, were also important to the natives. Fishes particularly attracted considerable Indian energy and ingenuity because fish was a sizable part of the human diet. Naturally the distribution of fishes is related to the pattern of water bodies, but within this pattern different species were found to occur in various seasons at different places. These facts, of course, influenced the Indian fishing habits. Of the bird population in the region, only the waterfowl were of concern to the natives, and during the migration seasons, and in summer, variation in diet was afforded by the occasional meal of goose, swan or duck.

The resources of the physical environment once described form the framework within which human habitation exists. The aboriginal population was all part of one linguistic group but definite regional differences existed within the Mackenzie River valley in 1750. The thesis next describes the physical characteristics of the people and outlines their geographic distribution, and gives the distinguishing features of the individual groups. Consideration of the native people is confined to the Indians. Eskimos do inhabit the outer delta of the Mackenzie River and live along the coast both east and west of the river mouth. However, up until 1850 there was no prolonged contact between them and the people to the south that influenced the course of events. During the period of geographic exploration people like Franklin and Simpson met the Eskimos, but the traders never did.

Moreover, the most important elements of change occurring during this time came from the fur trade and affected only the Indians. For these reasons the Eskimos are not described but only mentioned where it becomes appropriate. The two aspects of differing regional physical properties and really distinctive human groups are brought together in a consideration of the way of life as it existed in the valley before the Europeans came. Very much the people were children of nature and their lives followed patterns of movement and activity closely allied to the patterns and dynamics of the environment. A chapter of the thesis considers this adjustment and describes the manner in which the Indians lived including shelter, dress, equipment, methods of hunting and fishing, and how these were related to the country they occupied.

The comparative serenity of the aboriginal life was irretrievably changed after Alexander Mackenzie made his voyage of discovery to the Arctic Ocean. To be sure the Indians had seen signs of the approaching fur trade through iron implements traded from other natives farther south, but they had never seen white men until 1789. After setting the background scene for these events, the thesis takes up Mackenzie's voyage and attempts to relate the recorded observations and impressions of the published journal to the geographic facts of the landscape through which he passed. This task, done here for the first time, was a difficult one because Mackenzie was not an experienced navigator or explorer. Moreover, the journal was published several years after the journey when undoubtedly his impressions were less fresh. Now, however, it is possible to trace the daily progress of Mackenzie's boats with some element of precision. From this time onwards traders

extended their network of forts throughout the region and by 1850 had made contact with all of the Indians tributary to the Mackenzie and Liard rivers. During the period there was trade rivalry, first between the North West Company who explored the regions and the X.Y. Company of Mackenzie, and later between the Northwesters and the Hudson's Bay Company which in 1821 took over the control and management of the trade for the whole northwest.

In the early nineteenth century other groups invaded the region for the purpose of exploring and mapping a part of North America that remained unknown to the world at large. Lt. John Franklin suffered untold hardship and near disaster in his first expedition in 1819-21. There followed a succession of explorations: Franklin and Richardson mapped the shores of Great Bear Lake and extensive sections of the coast both east and west of the Mackenzie mouth; Dease and Simpson of the Hudson's Bay Company completed the mapping of the unknown shoreline of northern Alaska; Richardson and Rae working from Great Bear Lake attempted the same task to the east of the Coppermine River; and Lt. Pullen in his search for the lost Franklin succeeded only in covering old ground. These accomplishments are perhaps ~~better~~st known in comparison with the work of the traders because they were undertaken by public agencies and the accounts were published soon after the events. However, they did not make great or lasting impression on the natives except that the publicity of the northwest attracted later attention from missionaries and adventurers. These accounts are included to complete the account of activity in the Mackenzie valley.

By 1850 the valley was reasonably well known. Explorers had

mapped the Arctic coast, the great lakes and the major rivers. The fur trade after competition and conflict was stabilized, and the Indians firmly organized and attached to the various posts. It remains to examine to what extent the events of history changed the attitude of the natives towards the resources of nature. The simple economy of hunting and gathering was complicated by the practice of barter which withdrew the complete freedom of action previously enjoyed by the Indians. The surrender of freedom was not without compensation because the attraction of marvellous instruments like guns and iron traps held the promise of wealth and comfort. The Indians quickly made this exchange, and the thesis in its final chapters, considers a very different native way of life.

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It would be impossible to present this thesis without acknowledging the author's debt to those who took a direct interest in the project, and by encouragement and vital assistance, promoted its final completion. Professor J. B. Watson, advisor and friend, from the beginning gave freely from his experience and wisdom; without his abiding support the task would never have been finished. Other colleagues and friends, J. B. Watson, A. MacPherson, J. B. Robinson and G. V. Jones all gave aid and comfort at various stages of the work and helped to overcome the many difficulties encountered in the preparation of the text. Miss Barbara Stanforth and Mrs. Mary Darnley were generous of their time and help in the preparation of the manuscript respectively.

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The author is indebted to the University of Vancouver for the grant of leave to study for a Ph.D. degree and to the University of Vancouver for the grant of leave to study for a Ph.D. degree.

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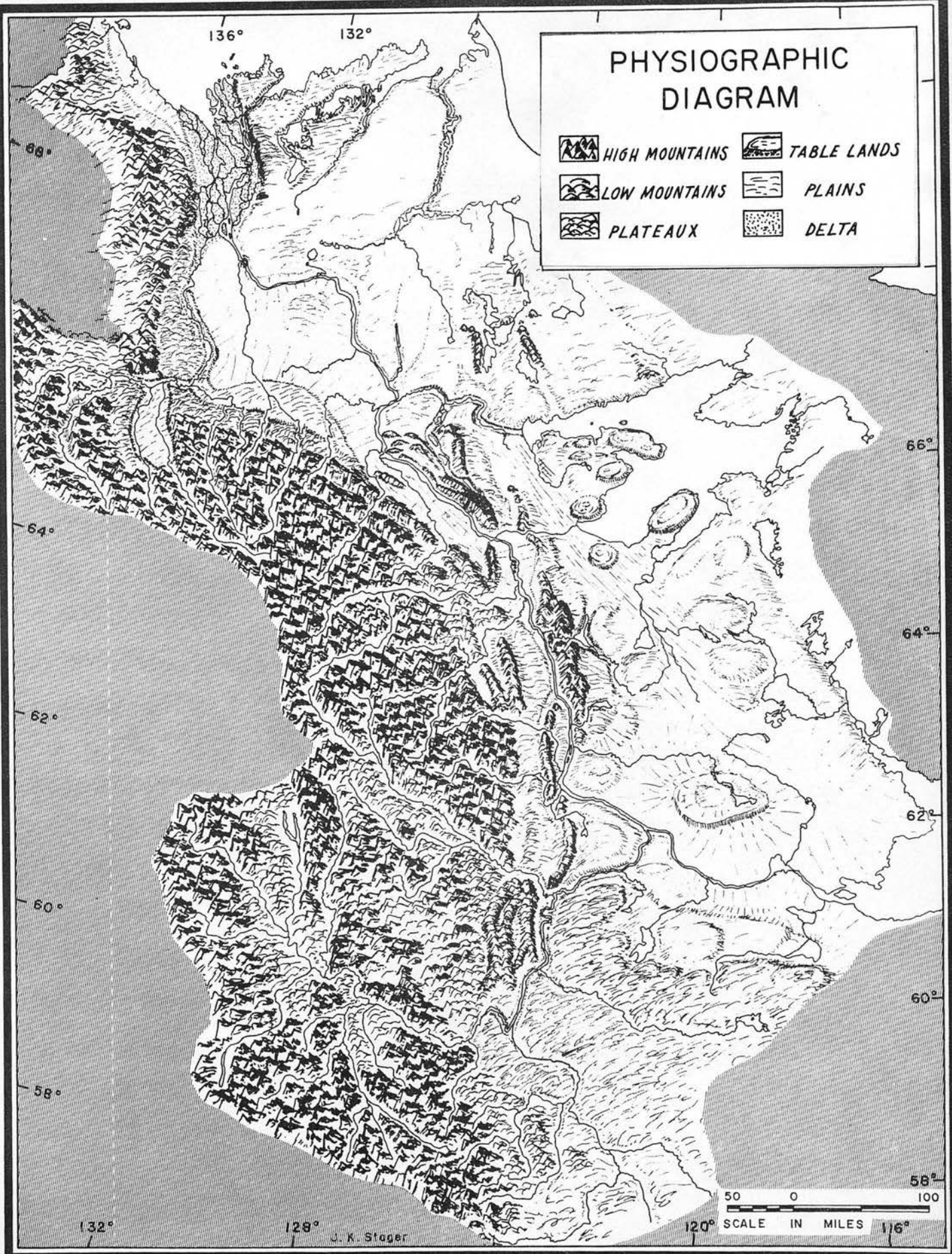
To these and others who in various ways made helpful contributions the author extends profound thanks.



PHYSIOGRAPHIC DIAGRAM

ROCKY MOUNTAINS	ATLANTIC COAST
GREAT PLAINS	FLORIDA
MISSISSIPPI RIVER	ALPS

I. THE LAND - PHYSICAL GEOGRAPHY



MAP 1.

PHYSIOGRAPHIC DIAGRAM

This pictorial representation of the topography of the Mackenzie basin comes from a thorough examination and generalization of the contoured published maps in the Canadian Topographic Series 1:250,000. In the northern part of the region where mapping is not yet complete, the author was able to refer to aerial photographs and mosaics, and to draw upon earlier aerial photograph interpretation work he did while employed at the Geographical Branch, Department of Mines and Technical Surveys, Ottawa. Some data is based upon field work in the vicinity of the Mackenzie Delta.














BEDROCK, STRUCTURE AND TOPOGRAPHY

The Mackenzie Basin northwards from Great Slave Lake to the Arctic Ocean has for its axis the Mackenzie River named after Alexander Mackenzie, who was its discoverer and explorer. The river is 1,071 miles long and its unchallenged, steady flow is fed by many tributary streams draining a region of over 360,000 square miles. This river is not only the axis of the region, it is also the main artery.

Almost half of the drainage basin is mountainous. From the west, youthful streams tumble over many rapids down to the main river in a type of drainage characteristic of the northern extension of the Canadian Cordillera. Exploration and travel through the whole country followed the stream pattern, and extensive penetration of this physiographic province was successfully delayed by its canyons and water-falls.

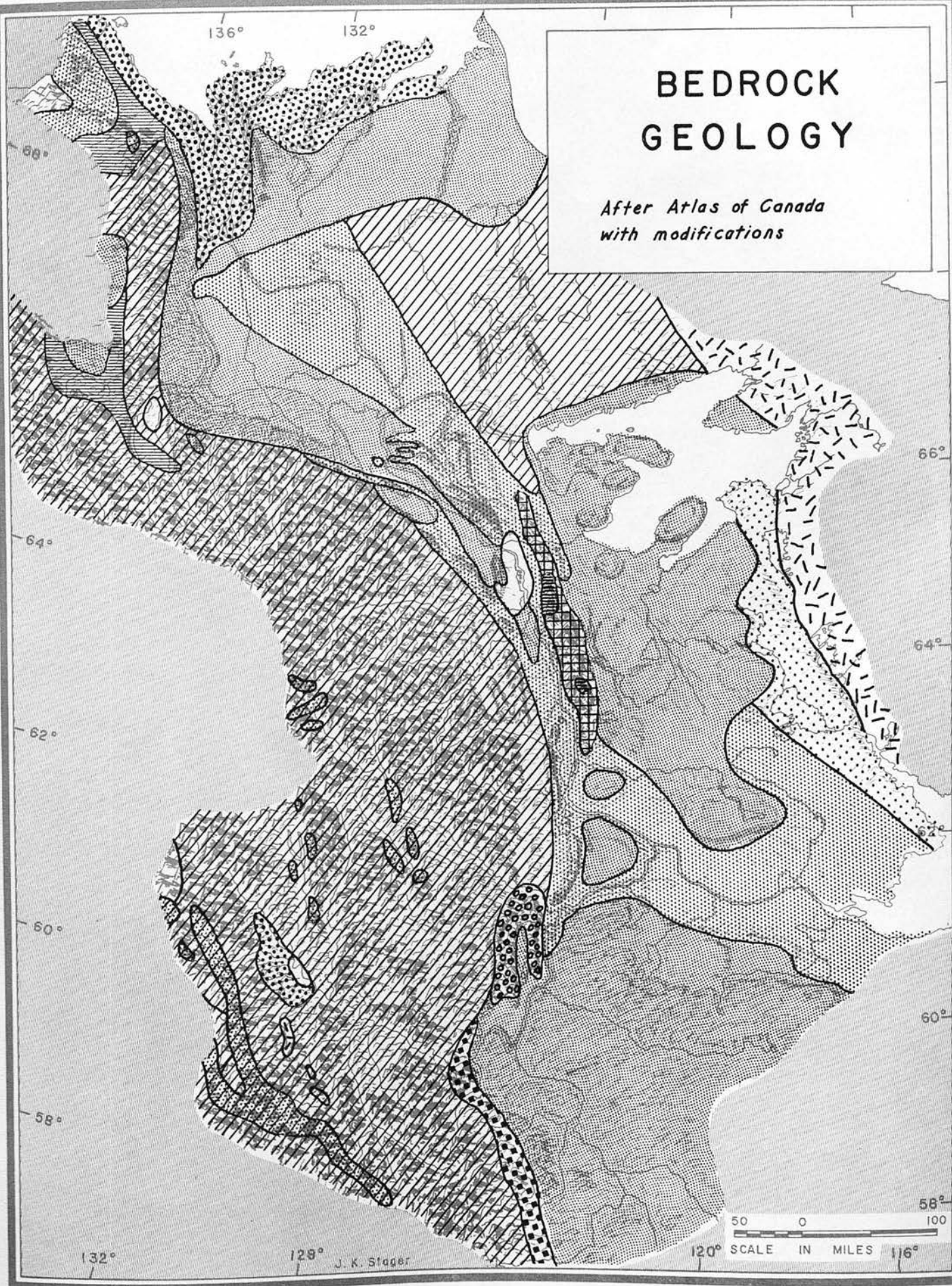
The eastern margin of Mackenzie drainage lies along the edge of the Canadian Shield. Although the shield itself is, for the most part, beyond the region under discussion, some of its glacially deranged drainage makes its way to the Mackenzie River via Great Bear Lake. Between the Cordillera and the Canadian Shield is the northern extension of the Interior Plain which tapers from a broad plain in mid-continent to a narrow projection where it meets the northern ocean. The Interior Plain is the central physiographic province which gives topographic expression to more than half of the Mackenzie region.

LEGEND

-  *Pleistocene and Recent*
-  *Tertiary - undifferentiated*
-  *Mesozoic - undifferentiated*
-  *Cretaceous*
-  *Triassic*
-  *Mesozoic intrusives*
-  *Palaeozoic - undifferentiated*
-  *Carboniferous*
-  *Devonian*
-  *Silurian*
-  *Ordovician*
-  *Cambrian*
-  *Precambrian*

BEDROCK GEOLOGY

*After Atlas of Canada
with modifications*



MAP 2.

BEDROCK GEOLOGY

The modifications made by the author on this map are based upon new topographic evidence gained from recently published map sheets. They are confined mainly to the areas of Cretaceous rock which are believed to cap the mesa and plateau landforms on the Interior Plain (Map 5). M.Y.Williams and W.H.Mathews, both with field knowledge of the region, were able to confirm these interpretations. In other areas, the geological boundaries were altered to conform with the topography, particularly in the Franklin Mountains, where the geology was mapped prior to clear understanding of the surface configuration.

NORTHERN CORDILLERA

The Canadian Cordillera is part of a wide belt of mountains and plateaux that pass through the continent on the borders of the Pacific Ocean. Mackenzie River and its western tributaries drain about 150,000 square miles of the Cordillera, which is only a small portion of the entire mountain system. There are four main groups of mountains within the eastern system of the Cordillera in the Mackenzie region: the Arctic Mountain Area is represented by the Richardson chain; south of the Richardson Mountains are the Mackenzie Mountains, which cover by far the largest area of the four groups; the southern part of the Mackenzie region comprises the northern end of the Rocky Mountains; the fourth group is the Franklin Mountains, a chain located immediately east of the Mackenzie River and separated from the main Cordilleran mountain mass by the Mackenzie Plain.

Northern Cordillera - Bedrock Geology

The mountains themselves are folded, fault-block structures, and as such, are the eastern manifestations of the series of orogenies causing the Canadian Cordillera. The eastern folds are not as severe or as complex as elsewhere within the Cordillera, but they have resulted in a distinctive physiographic division of the terrain. The folds have also been uplifted, and subsequent erosion has exposed the oldest Palaeozoic rocks. In the McConnell Range of the Franklin Mountains, Williams (1921) found Cambrian sediments forming the core of the high ground east of the river. Mt. Clark (4,798 feet) opposite the mouth of Keele River and Cap Mountain (5,100 feet) northeast of Wrigley, are the highest peaks of the range wherein Cambrian

sandstones, quartzites and shales are exposed (Williams, 1921). Ordovician sediments have not been identified in the immediate vicinity of the Mackenzie River, and a disconformity separates the Cambrian from younger rocks. More important are the uplifted Silurian limestones and dolomites which form the main rocks exposed all along the McConnell Range from Willowlake River north almost to Old Fort Point on the Mackenzie River, and are thus the backbone of this range. A splinter mountain range of Silurian limestones trends almost due north from the north end of the McConnell Range, crosses the Great Bear River and dies away 50 miles north of the river crossing.

Devonian sediments are common throughout the Mackenzie region and are represented at various localities on both sides of the river from Great Slave Lake to the delta. In the Cordilleran province they have been folded and/or faulted to build some of the ranges of the Franklin Mountains. North of Great Bear River, beginning at Bear Rock (1550 feet), and trending to the northwest is a low range called the Norman Range. It is generally cuesta-like in form, and exposed along its axis are resistant Middle Devonian limestones and shales that at one point reach a height of 3200 feet. The entire structure disappears to the north, becoming lower in elevation as the folds of the range splay out in four main fingers where the Devonian sediments are pinched out. Petroleum occurs within the Devonian sequence along the west flank of the Norman range. When the oil was discovered in 1920, production developed to serve local needs until World War II when the field was explored widely to increase the yield. After the war, the production dropped to meet only the requirements of the

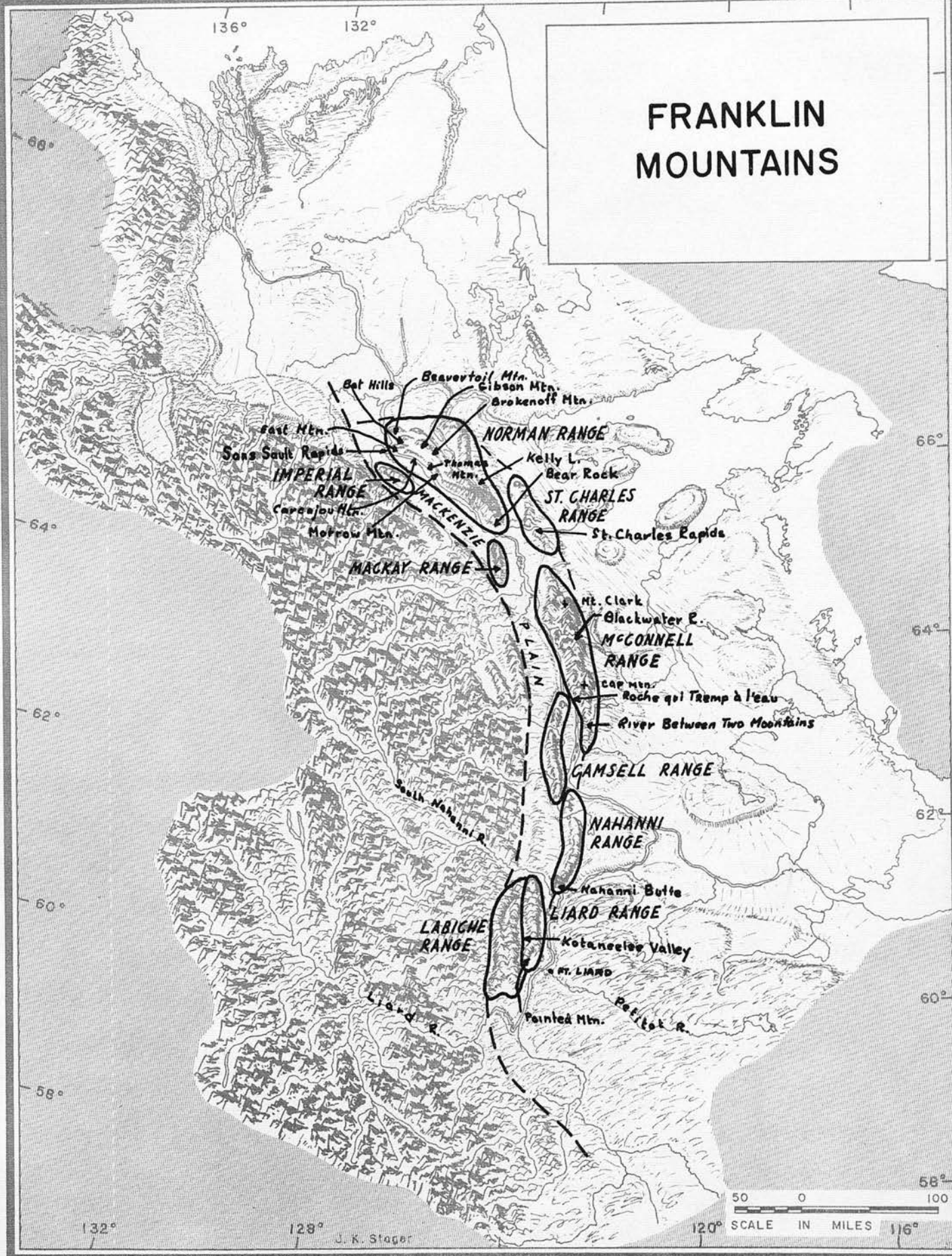
district. (Stockwell, 1957, p. 389).

Devonian sediments are exposed in some of the splinter ranges which are part of the Franklin Mountains. Nahanni range and Camsell range lying en echelon from south to north are both steep-sided cuestas or hogbacks that link McConnell range to the Liard and La Biche ranges at the southern end of the chain. The rocks of Mackay range, another splinter range, are Devonian and Silurian limestones which form a sharp ridge on the west side of the Mackenzie River opposite Bear Rock. Imperial range west of Norman Wells is similar in age and form. (Geological Survey of Canada, Map 1055A).

Carboniferous limestones, in synclinal basins stand up in positive relief to form the Liard and La Biche ranges, and the older sediments in this vicinity are less resistant shales which are exposed in the lower ground. (Douglas and Norris, 1960).

The Richardson Mountains, Mackenzie Mountains and Rocky Mountains have not been extensively explored and the geology is not known in detail. For the most part they are underlain by Palaeozoic sediments except for the northern end of the Richardson Mountains, where Mesozoic sediments occur. Along the eastern edge of the Richardsons, the rocks are not much disturbed, being uplifted and remaining nearly horizontal or dipping slightly to the east. Further inland, these rocks are more intensely folded and subsequent erosion has developed a rugged surface. (Bostock, 1948; Goodman, 1951). In the Mackenzie Mountains, much the same general conditions exist; the eastern flanks are gently folded Cambrian, Ordovician, Silurian and Devonian rocks which form the western limb of a wide synclinal structure. The Mackenzie River flows along the syncline with axis

FRANKLIN MOUNTAINS



MAP 3.

FRANKLIN MOUNTAINS

The subdivisions of the Franklin Mountains are essentially the same as those given by Bostock (1948). However, with the recent publication of many new contoured topographic maps on a scale 1:250,000 and the use of aerial photograph mosaics, it has been possible for the author to be more accurate in outlining important ranges. Also the pictorial representation of the topography closely approximates reality and was not possible before the availability of these two new sources of information.

between the Franklin Mountains on the east and the Mackenzie Mountains on the west (Goodman, 1951). Behind the eastern edge of the Mackenzie Mountains the strata have been only gently folded, but folding has been more intense in the west. There are also intrusions of Mesozoic age. The northern Rocky Mountains are not well known; they are composed of Palaeozoic strata among which limestone is common (Bostock, 1948, p. 6).

Northern Cordillera - Physiography

Franklin Mountains

North of the 60th parallel the Franklin Mountains make up the eastern ranges of the Cordillera belt. The southern extremity is somewhat indistinct because the mountains south of South Nahanni River merge with the upland plateau of the Liard River. But as one traces the Franklin chain northward, it follows a separate arc towards the west with its individual ranges separated from the western mountains by a portion of the Mackenzie plain and the Mackenzie River. The Franklins are over 500 miles long and at their northern end they are more than 30 miles wide. Since the ranges of the chain lie en echelon, the entire belt is usually only one range wide, although there is an exception at the south end where La Biche and Liard ranges parallel one another. At the northern end the structures splay out into four finger-like protrusions and assorted spurs.

The topography of the Franklin Mountains is due, on the whole, to the underlying structure. The ranges appear as broad anticlinal and synclinal ridges, or as up thrust or overthrust blocks. The mountain fronts are generally distinct, and most ranges erupt suddenly from beneath the nearly flat-lying Cretaceous and Tertiary sediments

of the plain, and display high cuervas and hogsbacks composed mainly of carbonate rocks. Such resistant strata have preserved bold relief while the softer, younger strata have been eroded away.

At least nine ranges can be distinguished within the Franklin Mountains. Some are well known and bear distinctive names, while others have been tentatively outlined and named.

La Biche Range

The La Biche Range marks the eastern edge of the Liard Plateau and takes the form of two broad, high ridges about 90 miles long. (Map 3). The western ridge has summits that reach 4500 feet in the south, and 5500 to 6000 feet at the northern end but the relative relief is of the order of 1500 to 3000 feet. The eastern ridge differs only in that it is narrower, and it merges with its neighbour at the northern end then the two fade as distinct topographic forms. The eastern margin of the La Biche Range along the Kotaneelee River appears as a sharp and solid rampart, a change that is much more abrupt than the transition from the Liard Plateau to mountains on the western margin of the range. Although it is not impossible for men on foot to cross the range there are no easy passes or valleys through the mountains and, therefore, it is likely that the La Biche Range was a barrier to contact between those natives who roamed the western plateau and those who lived along the Liard River and in the plateau country farther east.

Liard Range

The Liard Range rises at Pointed Mountain across the Liard River from Fort Liard and runs northward for about 60 miles parallel to La Biche Range in a narrow "S" curve form. It is not as high as the

range to the west although some peaks of 5500 feet occur at the northern end. The relative relief from the valleys on either side to the mountain peaks is 2000 to 3500 feet. Near the southern end there are two valleys which cut through the mountains but these are the only crossings in an otherwise solid rampart. The range can be regarded as a reinforcing barrier to east-west movement of people in this latitude, especially for those who approach from the east and view the high, forbidding peaks from the Liard River flowing northward along the base of the range.

Nahanni Range

The South Nahanni River flowing in a youthful valley follows a course around the north end of the Liard range and joins the Liard River just south of Nahanni Butte (4500 feet). The valley, probably antecedent in origin, is the first major break in the southern end of Franklin Mountains. Although the valley provides a route through these mountains, the stream itself is difficult to navigate even in canoes because rapids, waterfalls and seasonally fluctuating flow limit any penetration from the east.

Nahanni Butte is the southern end of the Nahanni Range, a narrow, - one to two miles - bold hogsback mountain that can be followed for 80 miles northward to Camsell Bend on the Mackenzie River. The eastern front is marked by a major fault (Bostock, 1848, p. 16), and the strata dip away steeply to the west. Throughout most of its length the range is nearly 5000 feet high, except near the northern end where heights of 2500 and 3500 feet are common. A few small streams have cut low passes through the ridge, but the easiest access to the plateau and plain west of the range is from

the South Nahanni River or around the northern end from Camsell Bend via the North Nahanni River.

Camsell Range

The North Nahanni River, which makes a southward loop near its mouth, and in so doing separates the Camsell Range from the Nahanni Range, is another of the access routes towards the west. However, the river possesses the same youthful characteristics - rapids, water-falls and variable water levels - of almost all the streams draining from the Cordillera. It was, therefore, an unattractive valley for the native people who lived along the banks of the Mackenzie River, and besides it only led into unfamiliar mountains and to contact with unfriendly mountain Indians.

Camsell Range is 80 miles long and can be traced north then northwest to Root River from whence it curves back to the Mackenzie River and ends on the river bank opposite Roche-qui-tremp-a-l'eau. Like the Nahanni Mountains, Camsell Range is a steeply inclined fault block with the rocks dipping westward. When viewed from the Mackenzie River from Camsell Bend the scarp face displays a good strike section of the rock. As one passes down the Mackenzie, however, the range disappears behind the broad plateau surface which rises gradually from the river to 2500 feet. This is because the mountains themselves are low. The highest peaks in the centre part of the range are around 4000 feet.

The four ranges that make up the southern half of the Franklin Mountains - La Biche, Liard, Nahanni and Camsell ranges - are all on the west side of the Mackenzie River. Thus the Indians of the plain

with much of their life centering on the Mackenzie River and the lower Liard River came to regard these mountains as the boundary to their hunting territory. They may have ventured through some of the gaps between the ranges, but in general there was no need for them to face the challenge of a mountain environment and the hostility of the other natives who already occupied the mountain lands. Likewise, the mountain Indians, probably fewer in number, did not stray to the east beyond the mountain rim which they regarded as a protection for their own hunting grounds. The physical barrier, therefore, became a boundary in the pattern of human occupation.

McConnell Range

McConnell Range, some 140 miles in overall length, is the most southerly range of the Franklin Mountains on the east side of the Mackenzie River. Where the river flows past the southern limb of the range it enters the Cordilleran physiographic province and occupies a course within a broad trench inside the edge of the mountain frontier.

The range is a broad anticlinal structure which has been eroded to expose the old, resistant Cambrian rocks on the highest peaks Cap Mountain (5100 feet) and Mount Clark (4798 feet). Younger sediments that have resisted erosion form flanking ridges along the range so that at Blackwater River, where the range is 20 miles wide, there are three distinct lines of peaks parallel to one another. These merge into a single ridge towards the south and the crest of the ridge diminishes in height to about 2000 feet. A similar pattern is repeated towards the northern end except that the range does not disappear as a plunging fold, but vanishes as a series of isolated

knobs decreasing in elevation.

Three large tributaries of the Mackenzie River cut through the range and occupy glacially widened valleys. River Between-Two-Mountains drains west from Fish Lake and cuts the southern part of the range. Ochre River breaches McConnell Range 45 miles north of River Between-Two-Mountains, and Blackwater River flows through the widest part of the range. The native people came to use these valleys frequently for they were the easiest water routes through a barrier which separated the important hunting grounds on the glaciated plains east of the mountains from the major highway of the country, the Mackenzie River. Later when the fur trade drew more Indians from the interior plain to the Mackenzie River the valleys through the Mc Connell Range became very well-known trails.

St. Charles Range

This single range of mountains about 50 miles long lies across the course of Great Bear River. It is not high; most of the rounded knobs are between 1500 and 1800 feet, and one peak is over 2000 feet. Bostock (1948, p. 16) has considered this range as an extension of the McConnell Mountains but there is a clear topographic break between the two. At least 10 miles of relatively smooth country separates the north front of the McConnell Range from the abrupt southern end of the St. Charles Range.

The only major obstruction on Great Bear River occurs where the river crosses these mountains. St. Charles Rapids, although turbulent, could be negotiated safely by down-bound canoes and boats, but traffic upstream usually found the water too swift for paddles. Because the river drained an inland basin, there was a reliable flow

of water over the rapids in all seasons, and this route to the great lake was much travelled. Even in some winters the strong flow at the rapids prevented the river from freezing over so that the passage through the St. Charles Range was almost always hazardous. The natives also used other high passes across the range particularly near the northern end, although at no point was the low St. Charles Range a serious barrier to movement of people.

Norman Range

Bear Rock (1500 feet) on the Mackenzie River a few miles west of Great Bear River is the southern end of the Norman Range. This is a single ridge 60 miles long with the western margin parallel to the course of the Mackenzie River four or five miles inland, and appears as a cuesta dipping towards the southwest that presents a steep scarp face on the northeast side. The highest point on the range is 3200 feet which is found about 20 miles from the south end. This is the place also where the range is widest. Generally, however, the summits are around 2000 feet and they become progressively lower towards the north and the south.

Associated with the Norman Range and extending northwest are a series of anticlinal ridges modified by faulting. (Hume, 1913, pp. 60-67). The fault blocks, each between four and fifteen miles long and up to 1500 to 2000 feet high, lie en echelon in three chains and display cuesta forms mostly dipping towards the Mackenzie River. (Map 3). East Mountain, unlike the others, dips to the north west, and is a ridge around which the Mackenzie River flows to escape from the Cordilleran province out into the Interior Plain.

Around the eastern side of the Norman Range is a wide valley

occupied by several large lakes, of which Kelly Lake is one. From the size and direction of the valley it is likely a former course of the Mackenzie River which carried a large flow from melting glacial ice. The valley now has a series of misfit streams linking the lakes and draining north to Hare Indian River. This great valley nearly two miles wide with a gentle grade was a natural migration route for natives moving between the Mackenzie River and the western end of Great Bear Lakes, and later when the fur trade developed, the Indians found the marshy valley bottom a favorite place to take muskrats and beavers.

Mackay Range

Mackay Range, 15 miles south of Fort Norman, seems to be a splinter range lying south of the Norman Range on the west side of the Mackenzie River. It is a short (14 miles) narrow anticlinal ridge that stands almost vertically 1000 feet or more above the surrounding Mackenzie Plain and as such is a prominent land mark. (Bostock, 1948, p. 19). It was frequently used by explorers and traders to orient themselves in their movements throughout the vicinity.

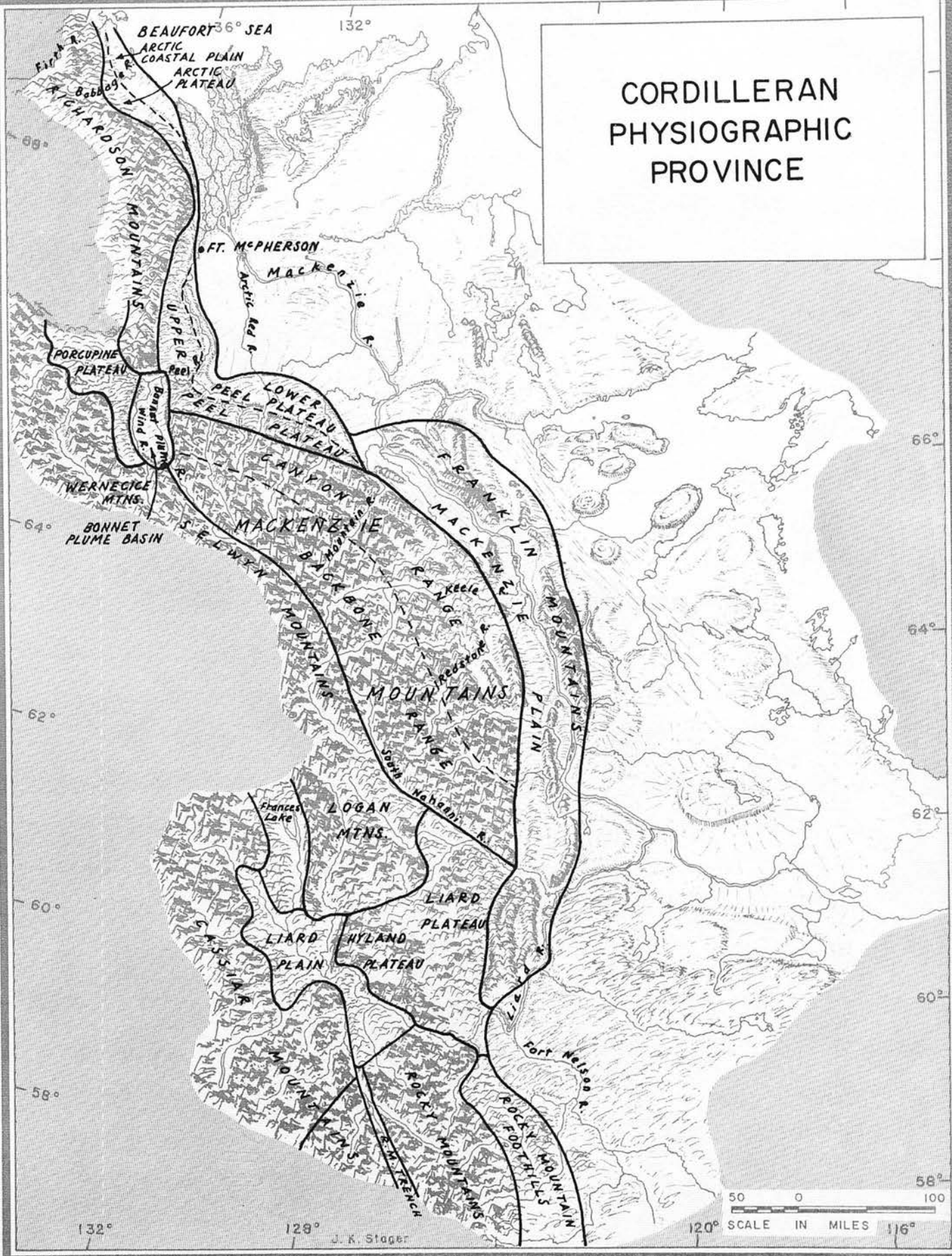
Imperial Range

Like Mackay Range, this anticlinal ridge is set alone in the Mackenzie Plain opposite Carcajon Mountain west of the Mackenzie River. It is similar to Mackay Range in dimensions and was probably looked upon by natives as a recognizable landform from which they could take their bearings.

Mackenzie Mountains

The Mackenzie Mountains extend northwestward from the South

CORDILLERAN PHYSIOGRAPHIC PROVINCE



MAP 4.

CORDILLERAN PHYSIOGRAPHIC PROVINCE

The author has followed the same system of landform classification and nomenclature as that proposed by Bostock (1948). Some of the boundaries have been redrawn to conform with the author's reinterpretation of the topography based upon the newly available maps and aerial photographs. The most noticeable changes occur in the outlining of the Liard Plain, and the grouping of the Hyland and Liard Plateaux together since topographic evidence did not seem to warrant their separation. There are also minor changes in the shape of the Upper and Lower Peel Plateaux.

Nahanni River in a scimitar-shaped pair of ranges to the Bonnet Plume River. (Map 4). The eastern rim of this curving front is a distinct topographic break with Mackenzie Plain, but the western boundary is drawn on the basis of scant geological information to separate the sedimentary rocks of the Mackenzie Mountains from the Selwyn Mountains, supposedly mainly intrusive rock. Before the character of the mountains developed to their present form, the drainage established itself in a radial pattern as if draining from a dome-shaped divide. These streams now cut across the main fold trends which parallel the mountain front, and occupy deep canyons where the mountains have been thrown up around them. Such canyons with their rapids made ingress difficult, and isolated the Mountain Indians, as much as the ranges, from their Mackenzie counterparts. The folding has not been too intense along the eastern side and broad flat-topped folds are visible on air photographs especially in the central portion of the Canyon Ranges. The parallel mountains are most distinctive in the northern two-thirds of Canyon Ranges. In the highest parts, between Mountain and Arctic Red Rivers, the summits average 5500 feet high with occasional peaks over 7500 feet. The sculpturing is more intense in the north and some of the large valleys have been widened by glacial ice. At the south end of the Canyon Range the mountain ridges converge and become indistinguishable from the western ranges, the Backbone Ranges where the Mackenzie Mountains display their most rugged form. Summit elevations are of the order of 6500 to 7000 feet with a few conspicuous peaks over 9000 feet. Near the continental divide glacial erosion has created the characteristic biscuit-board topography where corries bite into the upland. This is especially

so towards the southwest where higher precipitation nourished glaciers. A few small remnant glaciers are present today.

West of the Mackenzie Mountains forming the continental divide are the Selwyn Mountains which are geologically but not topographically distinct from the Mackenzies. (Bostock, 1948). In the north they are known as the Wernecke Mountains, and at the southern end near Frances Lake they are called the Logan Mountains. The central and southern part of the chain have jagged summits which are between 6000 feet and 7500 feet high, and this region shows evidence of strong alpine glaciation. The pre-existing valleys have been over-deepened by glaciers and partially filled with valley train. Now vigorous youthful rivers have reoccupied the valleys and drain east to the Mackenzie River or south to the Liard drainage. The northern, drier part of these mountains were not strongly glaciated and more rounded topography with deep narrow valleys tributary to the Peel drainage is characteristic. Although the Selwyns are remote indeed from the Mackenzie, and shut off from the plains by the intervening ridges, nevertheless, they were brought into the realm of the Mackenzie fur trade by the long tributary streams draining east.

The Mackenzie Mountains particularly were the hunting grounds of the mountain Indians. The movements of these people were guided by the valley systems although they made their way from one valley to another by passing over the low divides. Constantly the Indians ranged the slopes just as the game they sought did. Both animals and men worked up to the high ground and the alpine pastures in summer, but they returned to the protection of the valleys in winter. Although this rugged terrain presented difficulties in hunting and travel, it

was also a protection for the Mountain Indians. The unknown mountains prevented the people of the plain from making any major excursions into the hunting area of the Mountain Indians. The latter, secure in their own domain, had no strong urge to spread their way of life onto the plain. The differences in topography meant differences in man's adjustment to nature as will be seen later.

Richardson Mountains

The Richardson Mountains divide the Peel River drainage from the Yukon drainage. For the most part the range in the south is narrow, - 10 to 20 miles - but at the north end it widens out to more than a hundred miles across before the summits become lower and the mountains merge with the Arctic Plateau. The mountains, of sedimentary rock, have elevations of around 4000 feet and are not impressive. However, the surface is rough with closely spaced hills, V-shaped valleys and interlocking spurs that give the region the appearance of a mature but deeply dissected plateau. Around the edges of the Richardson Mountains the topography is less rugged for the summits are lower and broader than in the interior. During the Pleistocene, ice advancing from the Mackenzie Valley pushed up against the eastern mountain front and into some of the valleys, but within the mountains themselves there seems to be little evidence of Pleistocene glaciation. Moraines and erratics mark the limits of glacial ice advance.

Unlike most of the mountains in the central and southern part of the Cordillera the Richardson Mountains are not forested. Some woodland exists in the protected bottomland especially west of the

Peel Plateau, but for the most part the vegetation is Alpine (see Map 17). For this reason the mountain country held little attraction for the Indians who were forest dwellers. On the other hand, the unforested slopes and ridge crests permitted relatively easy routes of travel for men on foot so that the combination of a low mountain barrier and these easy ways permitted greater intercourse from one side of the Richardson Mountains to the other. To be sure, there were preferred routes, one of which was the passage via Rat River across to the Yukon drainage, which was later exploited by the fur trade. The mountains without forest, particularly near the northern end, in general presented too many hazards to the Indians and they avoided these lands. At the same time, the Eskimos living on the tundra made hunting excursions into these mountains and it was probably for this reason as much as any other that the Indians kept to the southern part of the range.

Rocky Mountains

The Rocky Mountains and the companion chain - the Cassiar Mountains - mark the divide of the Liard River system, and therefore, of the Mackenzie Region. The highest peak, Churchill Peak (10,500 feet) is almost on the divide between the Liard and Peace River drainage. Both chains are rugged and have been severely glaciated and even now they still support a few valley glaciers. In spite of the rough topography it is possible to recognize a remarkable accordance of summits around 7000 feet which suggest that an old erosion surface pre-existed the present topography (Bostock, 1848, p. 9). At the northern extremity of the Rockies the peaks are not as high - 4000 to 5000 feet - and the rugged character of the terrain

is much subdued, so much so that it is difficult to see where these mountains cease to be and where the Liard Plain begins. The boundary between the Rockies and the Liard Plateau is marked by the Liard River.

The Cassiar Mountains, separated from the Rockies by the northern end of the Rocky Mountain Trench, are topographically similar to the neighbouring chain. But the Cassiars have a batholithic core flanked by metamorphic rocks and are geologically older than the sedimentary Rockies.

Not only did these mountains divide the drainage of the area, they were the divide between native peoples. Those Indians within the Mackenzie drainage probably hunted up the major valleys leading back into the mountains, and they may have passed over a few of the low divides to make contact with Indians of the Pacific slopes. This happened especially after trade opened on the Pacific coast. For the most part, however, the Mackenzie Indians were content to remain on their side of the divide and were more attracted by the neighbouring Liard Plain, Rocky Mountain Trench, and Liard Plateau than the difficult terrain of the mountains.

Plateaux and Plains of the Northeastern Cordillera

The main mountain chains and ranges are, in places, separated from one another by plateaux and plains (Map 4).

Arctic Coastal Plain

The coastal plain extends on the average 10 miles inland from the Beaufort Sea. It is low and drops unevenly to the sea where rapid wave erosion has exposed truncation of headlands and low cliffs of frozen clays. At intervals large streams have cut wide gravel-strewn

flood plains that reach the sea between the intervening cliffs. From the Mackenzie delta to Firth River the plain is dotted with lakes and ponds which seem to be coincident with the extent of glaciation along the coast. (Bostock, 1948). These depressions were the summer nesting places for many waterfowl that attracted Eskimos but were generally too far beyond the tree line to draw Indians.

Arctic Plateau

Inland from the coastal plain the Arctic Plateau rises gradually to the low foothills of the Richardson and British Mountains. In the gap between the two mountain ranges, outlying blocks project from the rolling surface of the plateau, and other isolated knobs associated with the mountain folding, lie as shattered ridges or low hills interfingering with the digitate plan of the north end of Richardson Mountains. The plateau was a major zone of the summer migration of caribou.

Peel Plateau

The plateau surface is evident across the river from Fort McPherson and may be traced downstream thirty miles. Above the Fort, Peel Plateau splits into two levels. Where the Peel River has incised itself in the upland surface, a low plateau exists on the east side of the river and a higher one on the west side. The lower step is narrow until the place where the river breaks through the mountains from the west and turns north to the Mackenzie delta and the sea. South of this elbow, the low plateau front sweeps eastward and curves southward through 90° before it disappears along the mountain front near Mountain River; it is 30 miles wide where it is

crossed by Arctic Red River. The Lower Peel Plateau lies at an elevation of 700-750 feet and slopes northeastward gradually to the low plain. The Upper Peel Plateau rises abruptly over 1000 feet from the first step and is considerably dissected, especially where the main tributaries of the Mackenzie River cross it. Along the front of the Richardson Mountains the plateau character is better preserved although several streams cut across in deeply incised valleys, giving the whole landscape a youthful appearance. The general elevation is 2000 feet with isolated knobs that look to be eroded remnants of horizontal strata standing just over 2500 feet.

Before Peel River crosses the mountain front it receives two tributaries from the south, namely Wind River and Bonnet Plume River. Both flow inside the edges of a basin about 25 miles wide and extending south of Peel River for 55 miles. The basin effectively separates the Richardson Mountains from the Mackenzie Mountains. On the west side of the Bonnet Plume Basin is the 2000 foot plateau level, and although coincident in elevation with the Upper Peel Plateau, it is contiguous with an upland surface at the head of the porcupine River basin, and is therefore known as the Porcupine Plateau. Both uplands are very similar in surface character.

The upper Peel drainage embraces the Peel and Porcupine plateaux, and the Bonnet Plume basin. The youthful character of the landscape means that the rivers are in deep valleys, and Indian life was contained mostly in these valleys. There was, of course, hunting up the slopes onto the plateau surfaces where caribou moved towards the alpine meadows of the high plateaux. But life moved back and forth along the valleys, usually downstream at high water periods and, upstream when currents were slack. The Bonnet Plume basin,

forested but level, was an attractive hunting area.

Mackenzie Plain

The plain of the Mackenzie River itself (as distinct from the wider plain of the basin) is long and narrow, and has mountains on both sides; it might properly be described as a broad valley, particularly the portion through which the Mackenzie River flows. (Map 3). The Mackenzie Plain north of South Nahanni River and west of the Nahanni Range is about 15 miles broad, and its surface is about 1000 feet above sea level except where broad domes rise in places up to 2000 feet. North of the Nahanni Range, the Plain occurs on both sides of the Camsell Range and extends to the Mackenzie River. Inside, or west of Camsell Range, the plain is pinched out as the range trends towards the main Mackenzie Mountain mass, but east of Camsell Range, it becomes a plateau which rises gently from the Mackenzie River through 1500 feet to the broad summit at 2000 feet. Root River cuts diagonally across this part of the plain in a deep, broad valley. From the McConnell Range north, the Mackenzie River flows over the Mackenzie Plain entirely within the mountain province. Where the McConnell Mountains become broader, the plain shrinks to only 10 miles across and is really a broad valley in this section. The slopes instead of being plateaux and terraced down to the river are more or less smooth to the water's edge. There is, however, one riverine terrace one-half to one mile inland from the right bank of the Mackenzie River about 200 feet above the water. Downstream from Keele River the plain widens to form a large basin 30 miles across near the confluence of the Mackenzie and Great Bear Rivers. Tertiary rocks underly the basin and coal of this age is exposed by the river

north of Fort Norman. The coal has been burning intermittently since Mackenzie first saw it in 1789 and probably for a longer period of time. The surface of this basin, part of the Mackenzie Plain, is dotted with small lakes and many swamps. Downstream similar conditions occur, and except where Bear Rock locally constricts the plain, it is broad, shallow, and U-shaped all along the front of Norman Range. Pleistocene ice sheets deposited and scoured the strongly fluted till surface which floors this portion of the valley. Many lakes occur on the till surface that are elongated, rectangular in shape, and oriented parallel to the fluting along the valley axis. The northern end of the plain occurs where the Mackenzie River leaves the Cordillera and flows onto the Interior Plain.

The Mackenzie Plain was the most populous physiographic division within the northern Cordillera. Across it flows the Mackenzie River, which as a major avenue of travel and source of food, caused many natives to spend at least part of their seasonal existence on its banks. In summer when fish were the dominant food, people could move easily up or downstream to favoured locations, or the lakes on the plain away from the river were within easy reach. In other seasons when the natives followed big game, there were several access routes from the Mackenzie Plain to the Interior Plain via the eastern tributaries to the river. Thus the most important feature of the plain was the great river and its tributary streams which facilitated movement and provided convenient courses to other desirable areas. As time went on, of course, the river became the artery of life for the whole region.

Liard Plateau

West of the La Biche Range and north of the Liard River is a land surface transitional in character between plain and mountains. The Liard Plateau has no high summits, but is reasonably rugged as a direct result of stream dissection. Most of its surface area lies near 3500 feet, above sea level, and into this level the rivers have carved valleys 1000 feet deep, and at the eastern side as much as 2000 feet. Above the general elevation many higher peaks and rounded tops rise to 4000 and 4500 feet. To generalize broadly, the pattern of the high peaks form a rim around the edge of the plateau that is quite distinct especially on the eastern edge where some land is over 5000 feet high. Elsewhere the highlands are lower. Bostock (1948) distinguishes between Liard Plateau and Hyland Plateau on the basis of some alignments of structure which indicate sedimentary bedrock under the Liard Plateau. The Hyland Plateau, is not supposed to show these structures. A study of the recent maps of the area, however, reveals little topographic evidence for separating the two. The same general dissected upland grades northward into the rugged Logan Mountains east of Frances Lake. The plateau-mountain contact along the South Nahanni River is much more distinct. The southern edge is sharply in contrast with the Rocky Mountains across the Liard River; towards the west, the transition from plateau to the Liard Plain is abrupt.

The plateau was accessible from the Liard River in the south or from the South Nahanni River on the north side, and was sparsely inhabited by mountain Indians. They lived mostly in the river valleys and hunted over the neighbouring slopes. Because there were so few

people in the area, there was no real pressure on the limited game resources found there, and it is likely that movement of people was not great. The inaccessibility of the plateau and the restricted movement of its inhabitants caused the region to remain virtually unknown even after fur traders had been in the country for many years.

Liard Plain

The outline of the Liard Plain is very irregular and there is a gradual but distinct change from the plain to the surrounding plateaux and mountains. The valleys of Ranchiera, Frances and upper Liard Rivers really constitute the plain for they are broad and more or less flat. At its widest, the plain is 30 to 50 miles across, and the rivers flow over the surface of the plain rather than being cut drastically below the general level of 2000 feet. Occasional outliers of upland lie isolated around the edges of the plain and appear as erosional remnants of the plateau country round about. The narrow Rocky Mountain Trench opens on to the plain from the south, and a trench-like feature takes up again in the northwest near the upper Liard headwaters where the plain becomes lost in the mountains.

The Liard River describes a wide meandering course across this plain, and here where the river had a steady, unencumbered flow, there were attractions for the natives and their way of life. The Indians of the Liard Plain moved freely on the river, found fishing lakes in the pitted outwash and hunted along the banks of the Liard and its tributaries.

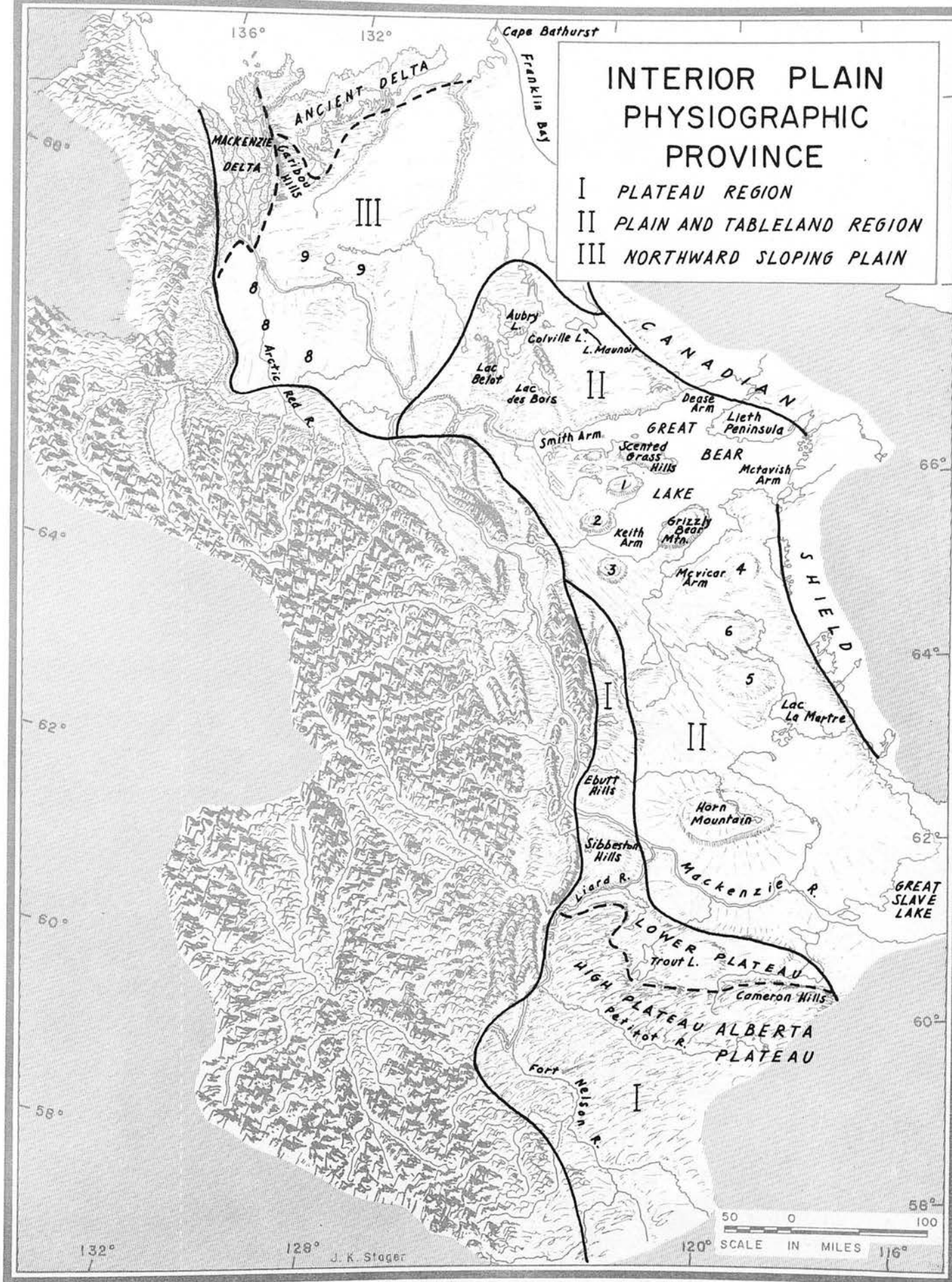
Rocky Mountain Foothills

The Foothills are drained to the Liard River by the Fort Nelson River and its tributaries. At this northern latitude the hills are plateau-like rather than folded, and do not differ greatly from the deeply dissected surface of Liard Plateau with which they merge in the north. The underlying bedrock is gently dipping Cretaceous rock (Bostock 1948).

THE INTERIOR PLAIN

Bedrock Geology

Between the Canadian Shield and the Cordillera is the northern extension of the Great Plains. In the Mackenzie drainage, this plain is between 150 and 250 miles wide. Frequently it has been represented as rather featureless, flat to rolling terrain with the general slope of the land towards the north. (Robinson, 1945, p. 31). Certainly the bedrock is nearly flat lying but dipping gently west. The oldest sediments are exposed in the eastern part of the plain where Ordovician rocks overlap the Canadian Shield and outcrop on the shores of Leith Peninsula, Great Bear Lake, and on the west side of the North Arm, Great Slave Lake (Map 2). Ordovician strata also occur on the shores of Lac la Martre. In the plain, Silurian rocks do not appear on the surface (Douglas, 1958, p. 12). Instead, Ordovician strata are overlain unconformably by Devonian strata where they have been mapped in the southern portion of the region. North of Great Bear Lake nothing is known of the bedrock geology; the best estimates would suggest that Palaeozoic rocks will be found. Undisturbed Palaeozoics, in general, contribute very little



MAP 5.

INTERIOR PLAIN PHYSIOGRAPHIC PROVINCE

The interpretation and classification of the physiography of the Interior Plain is here presented for the first time. It is based upon study of the new 1:250,000 mapping, and in places, confirmation from aerial photographs and field reconnaissance.

diversity to the topography of the plain. They dip slightly west and southwest, and appear to have been bevelled off before subsequent deposition.

Lying unconformably over the Palaeozoics are Cretaceous rocks composed mainly of shales and sandstones. It seems that the Cretaceous cover was at one time very extensive and the products of erosion from the older mountains in the west were carried and deposited by streams draining east. Now only parts of the old surface-covering remain, and they tend to form positive relief features taking the shape of flat-topped uplands. The Cameron Hills and the Trout Lake Upland are examples south of the Mackenzie River. Elsewhere, Cretaceous rocks form the caps of isolated but extensive "mountains", which stand a thousand feet and more above the plain. Horn Mountain, Sibbeston Hills, Ebbutt Hills, Grizzly Bear Mountain and the Scented Grass Hills are all examples. (Whittaker, 1922; W.H. Mathews, personal communication; Williams, 1937; G.S.C. Map 1055A). Cretaceous sediments also occur on the east side of the Mackenzie delta in the Caribou Hills, and presumably may be traced inland to the east. At Cape Bathurst there are Cretaceous outcrops and also at various points along the coast of Franklin Bay. With such widespread evidence it is believed that a considerable portion of the northern plain is underlain by rocks of this age.

Interior Plain - Physiography

There are three major physiographic divisions on the plain. On the east flank of the Cordillera, especially along the Franklin Mountains is the Lower Plateau of the Plateau Region (Map 5). The

first step of the upland lies along a line 30 to 40 miles south and parallel to the upper Mackenzie River where it follows a westerly course out of Great Slave Lake. Trout Lake is on this first step. Just south of Trout Lake is the step up to the top of the High Plateau or Alberta Plateau whose summit surfaces are between 2300 to 2500 feet along the rim, but decrease slightly in elevation towards the south. The drainage, nevertheless, flows north, with Petitot River, Fort Nelson River and their eastern tributaries all occupying incised valleys 200 to 500 feet deep. The whole surface of the High Plateau is best described as rolling with relative relief up to 1000 feet, and basin characteristics on either side of the Fort Nelson River. The plateau region continues on the north side of Liard River where it is called Sibbeston Hills and where Cretaceous rock caps protect the high relief with summits up to 2500 feet. North of the Mackenzie River are the Ebbutt Hills where other Cretaceous caps mark the continuation of plateaux along the Cordilleran front. At this place, the plateau is about 50 miles wide, then gradually narrows and disappears at the north end of McConnell Range.

The second physiographic division of the Interior Plain is a large area, one-half of the entire plain, that is centrally located. This is the Plain and Tableland Region. It extends from south of the Mackenzie River at Great Slave Lake, north of Fort Good Hope, in the interior, includes the country surrounding the five large lakes - Aubry, Belot, Des Bois, Colville and Maunoir - north of Great Bear Lake. Typical of the region is the country around Horn Mountain. Here, a low flat plain about 500 feet in elevation along the banks of the Mackenzie River rises gently away from the river on both sides to

700 and 800 feet at the base of Horn Mountain, and 900 to 1000 feet below the Alberta escarpment and the Cameron Hills. Abruptly out of the plain rise such mesas as Horn Mountain surrounded on all sides by steep slopes almost 2000 feet high. The highest points on Horn Mountain are 2700 feet and its more or less flat top is liberally dotted with small lakes. Thus the topographic expression of this second physiographic division of the plain can be described simply as plain interrupted by mesa uplands. There are several of these uplands, of which Horn Mountain is the most conspicuous. At Great Bear Lake, Grizzly Bear Mountain, whose summit is 2000 to 2200 feet above sea level, is also covered with small lakes. This mesa forms the peninsula between Keith Arm and McVicar Arm. Similarly situated is a third mesa, Scented Grass Hills, which occupy a peninsular location between Keith Arm and Smith Arm, and rises 1300 to 1500 feet above the surface of the lake (515 feet). Two other mesas (1, and 2 on Map 5.) stand on the west side of Keith Arm and have summits of 1800 feet and 1600 feet respectively. Another tableland (3) on the south side of Keith Arm, is 1600 feet high. Immediately southeast of McVicar Arm is a hill (4), not as well defined around the edges as the mesas, but still prominent with a height of 2300 feet. It is an outlier of the Ordovician escarpment facing the shield. At the northern end the cuesta ridge is 1500 feet high, but it decreases southward to 900 feet and is lost in the plain before it reaches the North Arm of Great Slave Lake. North of Lac la Martre is a dome-like upland with summit levels near 2200 feet (5), and nearby (6) another 1900 foot high, show fluting by glacial ice. The level of the plain from which these eminences rise increases in elevation

from 500 feet near Horn Mountain to over 900 feet south of Great Bear Lake. At the west side of the lake, however, the plain becomes lower again, 600-700 feet, but on the north side the general level of the land is near 1000 feet. North of Great Bear Lake are a few long ridges, some clearly 30 or 40 miles long, and in places 2200 feet in elevation (7). It is possible that the origin of these ridges is associated with the mountain building that formed the Franklin Mountains.

The third physiographic division of the Interior Plain is the Northward Sloping Plain found on both sides of the Mackenzie River between Fort Good Hope and Point Separation, and includes the land north to the Eskimo Lakes. The uniqueness of the division lies in the lack of prominent upland blocks, and in the many thousands of lakes on its surface. Particularly in the valley of the Arctic Red River (8) there are literally thousands of tiny lakes on a relatively flat surface just over 500 feet above sea level. This evidence suggests that the area was once a basin where ponded meltwater collected. On either side of the great bend of the Mackenzie River near the delta where the river turns due west, there is an upland dome (9) with summit levels just over 1000 feet, and through it small tributaries of the Mackenzie have become quite deeply incised. The land between this upland and the Eskimo Lakes is low, but gently increases in elevation towards the east and the Anderson River. The Anderson has carved quite a deep valley, 300-600 feet, into the plain.

On the north side of the Eskimo Lakes rooted to the Caribou Hills, is a long peninsula composed mainly of deltaic sands deposited by an ancient Mackenzie River (Mackay, 1956). The peninsula is

dotted with lakes many of which have a preferred orientation with the long axes of the lakes trending almost due north-south. Also on the peninsula are nearly 1500 earth mounds, mostly in the shape of a mud cone, which are called pingos. Pingos all are found in lake beds, some of which have become dry. (Stager, 1956). The largest of the pingos is about 135 feet high, and although many others are lower, they still are the highest eminences from which to view the surrounding flat country.

The Interior Plain was the home of most of the natives in the Mackenzie Valley and for the most part they lived and moved along the river courses or on the shores of the great lakes. Thus it was the low country along the valleys and the slopes back from the rivers that were important to the people, especially in the summer when water travel and fishing were important activities. Even in winter people followed the valleys if they were the shortest routes. Many Indians that lived along the Liard River hunted over the High Plateau which they approached via the Fort Nelson River and its tributaries, or along the Petitot River valley. This upland without many lakes led the people to depend more upon game animals than upon fish, and the Liard Indians were more active hunters because of it. The people of the upper Mackenzie-Great Slave Lake region tended to centre their life close to the river and lake or they moved inland on tributary streams. In winter when the waterways froze and the fishery failed, they hunted on the low plain. High mesas like Horn Mountain, mainly bare of forest and offering no protection to game animals, held little attraction for the natives. They did use hills as vantage points to spot game - for instance the

cloud of steam that rises from a herd of caribou on very cold days - or to communicate with one another by signal fires. More often, however, they moved from lake to lake in winter because the frozen surfaces provided trails that could be direct and unencumbered by forest.

In the central part of the Plain and Tableland region, Indians hunted and fished in numbers on the low glaciated plain south and west of Great Bear Lake. Many lakes and good fishing rivers were the principal attraction. The low, wooded country with lakes was also a favorite range for moose. In terms of migration this area was better supplied with natural routes. The valleys through the Franklin Mountains and the routes from the great lake via Great Bear River or Hare Indian River both permitted easy communication to the Mackenzie River, the main avenue of movement. Also the large expanse of Great Bear Lake itself gave attractive, easy summer and winter trails for parties hunting or migrating along the shore. In almost every case the movement of people was along the Mackenzie or eastward from the river to the plain with its lakes. Rarely was there an urge for the plains people to move toward the mountains. In the lower Mackenzie Valley, or the Northward Sloping Plain Region of the Interior Plain, there were far fewer lakes except in the basin of Arctic Red River and the flats between Peel Plateau and the Mackenzie River. Favouring the low ground and the water routeways, Indians in the lower Mackenzie area used the Arctic Red River basin and also the lower Peel River as their hunting territory, and they travelled and hunted extensively at the head of the Mackenzie delta. Wide exploitation of the lakes and ponds, and the delta channels for muskrat hunting was curtailed to avoid contact with the Eskimos who

lived along the outer edge and occasionally penetrated upstream. More dispersed Indian occupations of the land occurred east of the river where more emphasis upon hunting migratory animals caused wide Indian travel. The plain has no major topographic obstacles and the headwaters network of the Anderson River drainage probably provided many attractive routes at least to the tree-line.

THE CANADIAN SHIELD






Bedrock Geology and Physiography

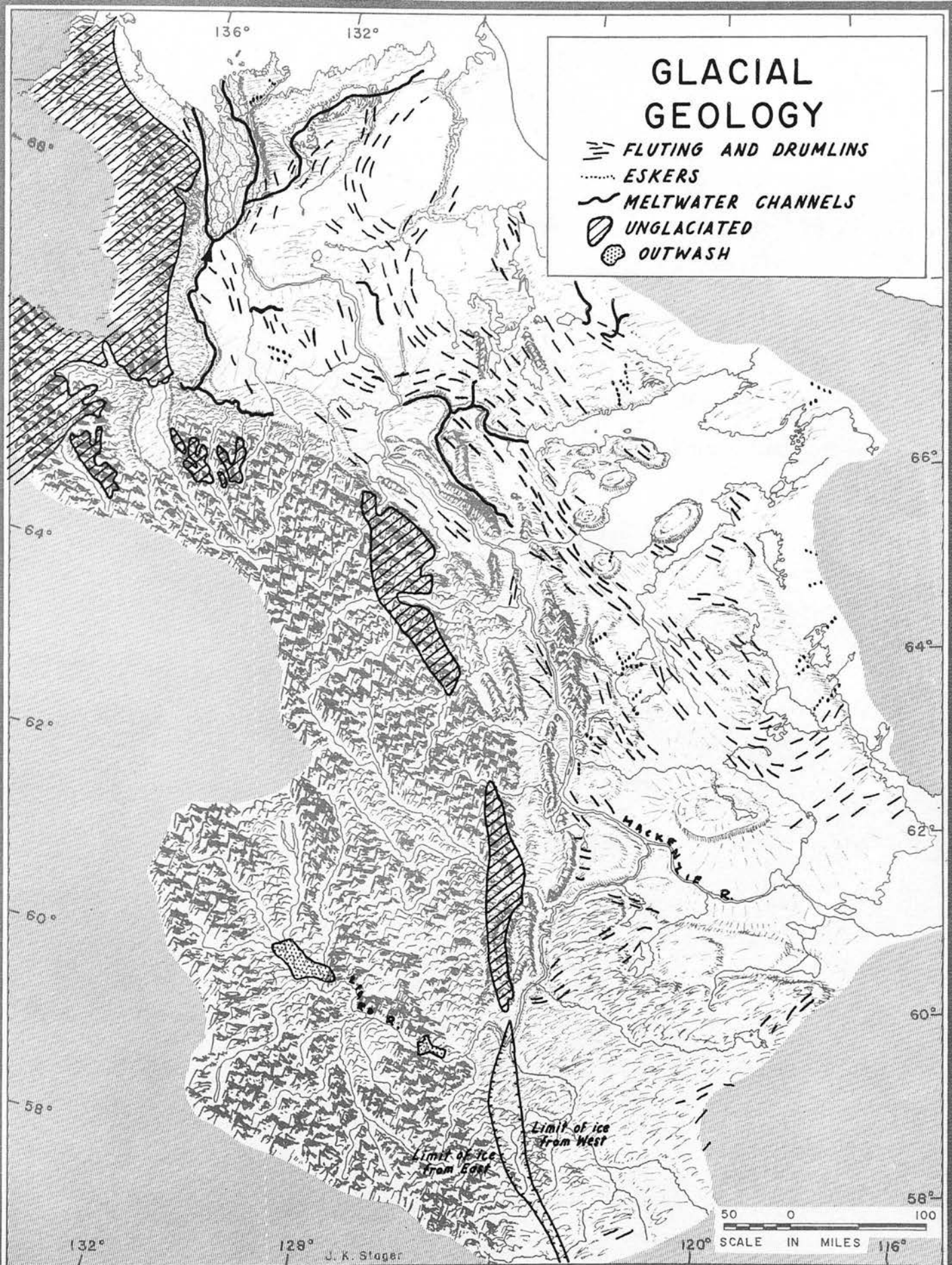
The oldest rocks in the Mackenzie region are the Precambrian granites and gneisses along the eastern rim of the drainage basin. The Canadian Shield is east of the line of contact running from the head of the North Arm, Great Slave Lake, through the chain of lakes to McTavish Arm, Great Bear Lake. (Map 2). On the north side of McTavish Arm and around the end of Dease Arm the rocks are Precambrian. The boundary of the Shield then sweeps north almost directly to Darnley Bay. Only a small part of the Shield is within the Mackenzie region, but in this small section the topography is distinct. Rock surfaces once covered with unconsolidated material, have been swept clean by glaciation. Pre-glacial drainage was thoroughly destroyed, and now an immature drainage with water spilling over from one ice-scooped basin to another forms many interconnected lakes so characteristic of the surface of the Shield. The numbers of lakes are legion, and the pattern of drainage often assumes angular courses in response to faults in the rock having been deepened by glacial ice. North of Yellowknife the surface is remarkably even at about 600 feet above sea level. It rises northward to somewhat over 1000 feet north of Great Bear Lake. Gradually towards the north coast the

country is increasingly covered with glacial drift and the character and influence of underlying rock becomes less marked.

People equipped with canoes could move easily across the surface of the Canadian Shield. The lake-to-lake drainage offered a variety of routes between camping places, and these routes were reliable throughout the summer season. Reservoir lake basins helped to sustain the flow in rivers even into the late summer when other rivers on the plain slowed to a trickle. Summer water routes often became the winter trails too because they represented the easiest gradients through the land. There can be little doubt that the initial dictates of topography and drainage affected men and animals, and once established, the routes and hunting grounds were fixed in the pattern of living.

GLACIAL GEOLOGY

-  FLUTING AND DRUMLINS
-  ESKERS
-  MELTWATER CHANNELS
-  UNGLACIATED
-  OUTWASH



MAP 6.

GLACIAL GEOLOGY

The main source used to compile this map is from The Glacial Map of Canada, (1958), although the author was able to contribute data for the northern half of the area from field observations and from examination of aerial photographs. Other data were taken from personal communications with J. R. Mackay and W. H. Mathews.

GLACIATION, RECENT DEPOSITS AND SOILS

During the Pleistocene Epoch glacial ice covered most of Canada at one time or another. In the Mackenzie region, however, areas occur which show no evidence of ice erosion or deposition. Most of the unglaciated portions are mountainous, but the coastal plain west of Herschel Island is an unglaciated lowland. The reason for the absence of evidence of glaciation is simply due to the fact that the Mackenzie region was not, generally speaking, an area of ice accumulation. The temperatures were undoubtedly low enough, but the precipitation, not unlike the present time, must have been very light so that even in a brief summer the sparse snowfall could not persist from season to season. Local high ground in the mountains, particularly in the farthest south and west, supported their own ice caps which ultimately contributed to an ice sheet born of a Cordilleran center of accumulation. But in the north in the Richardson Mountains, there does not seem to have been even enough moisture at higher altitude. (Bostock, 1948, p. 37). Likewise, the eastern ranges of the Mackenzie Mountains defended by distance and the prominent topographic barrier from the Pacific moist air show little evidence of glaciation, and what evidence there is is confined to the valleys of the transverse streams that may have had ice enter them from the plain to the east (Bostock, 1948, p. 25). There is serious doubt that much of the Canyon Ranges supported an ice cap (Wilson, 1958). This also holds true for another eastern range, La Biche Range, and the mountains just north of the South Nahanni River. (See Map 6).

That the ice sheets accumulated and spread from the region east

of the Mackenzie drainage is clear from fluting, drumlinoids and striations. Moving ice advanced to the west until it encountered the main mountain barrier and then was diverted north along the Mackenzie River. Even the Franklin Mountains were overtopped by ice, erratics having been found on the top of Cap Mountain 5100 feet above sea level. (Williams, 1923, p. 71). Local directional changes of ice lobes are apparent from the fluting; for example, the low country west of Lac La Martre and east of the Franklin Mountains shows ice movement diverted northward past Great Bear Lake and then, north of it, making a swing west around to the Mackenzie River at Fort Good Hope. Another lobe spread north from the river bend at Good Hope directly to the Eskimo Lakes and then curved east towards Cape Bathurst.

The ice sheet was quite deep since it completely covered the Franklin Mountains. Erratics and other evidence of glaciation have been spotted along the Mackenzie Mountain front, where ice from the east abutted on and penetrated many of the valleys. In the southern part of the region the highest evidence is over 5200 feet. On the Canyon Ranges evidence occurs at 4100 feet, but in the Richardson Mountains 3000 feet and 2100 feet are the highest known limits. It is clear that the ice sheet was thinner towards this northern margin. (Wilson, 1958).

The present surface of the terrain in the region which was covered by ice has been modified by glacial deposition. This is particularly true in the Interior Plain physiographic province. Gross land forms, like Horn Mountain, and Grizzly Bear Mountain were not greatly modified by ice since they show evidence of having

caused diversion of ice lobes at least in the waning stages. Earlier, of course, they were completely covered. Great quantities of ground moraine were laid down under the areas of fluting, and nearly all the lineation occurs in morainal material. The widespread distribution of fluting indicates equally widespread occurrence of till. That the source of the till was mainly from the east there can be little doubt. Most of the Laurentian Shield was swept nearly bare of its weathered rock and quantities were left in the Mackenzie valley. This contrast was early noted by the traders who called the shield the "Stony" land. Even the bulk of the Indians tended to avoid it, and to live in the till-covered plains. This was not, of course, because the Indians used the till for agriculture, but because they found the forests thicker and the game was more plentiful on the till plains. The fluting in the till, where it was marked by long, narrow lakes often oriented Indian travel and settlement especially when the natives were anxious to catch both fish and waterfowl.

In the wasting stages of the ice sheets there may have been some ponding and spilling of meltwater south across the present drainage divide. (M.Y. Williams, personal communication). Later as the ice in the lower Mackenzie Valley melted, the existing northern gradient was uncovered and the ponded waters in the enlarged Great Bear, Great Slave and Athabasca lakes drained to the Arctic Ocean. Local diversion must have existed because a very prominent drainage channel of the proportions to carry at least the present flow of the Mackenzie River has been cut into the land surface east of the Norman Range of the Franklin Mountains. This channel joins with

another great channel, now occupied by a misfit stream, Hare Indian River, that at one time drained Great Bear Lake via Smith Arm (Cabot, 1946). Meltwater drainage also spilled from the headwaters of Arctic Red River across to the Peel River drainage. Locally other small channels carried water at some time during the last retreat but these seem to be few in number, probably because of an incomplete state of detailed knowledge. The larger of the meltwater channels were exploited as natural migration routes for the Indians and the remnant lakes and swamps afforded both fish and fur hunting grounds.

The flushing meltwaters carried quantities of debris which were deposited at various places within the Mackenzie drainage. Banks or terraces of fluvio-glacial matter, because often well-drained, were favourite sites of Indian camps. The centre of the Liard Plain is built of outwash material, and over it eskers or crevasse-filling form intricate surface patterns. (Bostock, 1948, p. 51). More outwash deposits occur farther downstream on the Liard, and widespread outwash sands and gravel have been found on the western and eastern flanks of Franklin Mountains (M.Y. Williams, personal communication). Elsewhere, great quantities of river-carried sediments have been distributed along the coast to form an interglacial Mackenzie delta east of the present one. (Mackay, 1956). Two small eskers on Richards Island that overly the ancient delta indicate that the sediments are interglacial. A long line of lakes from the Eskimo Lakes through Sitidgi Lake links up with the present Mackenzie River and this may represent an old drainage channel of the Mackenzie River associated with the building of the interglacial delta. (ibid. p. 10).

Eskers and raised beaches are not extensive in the region,

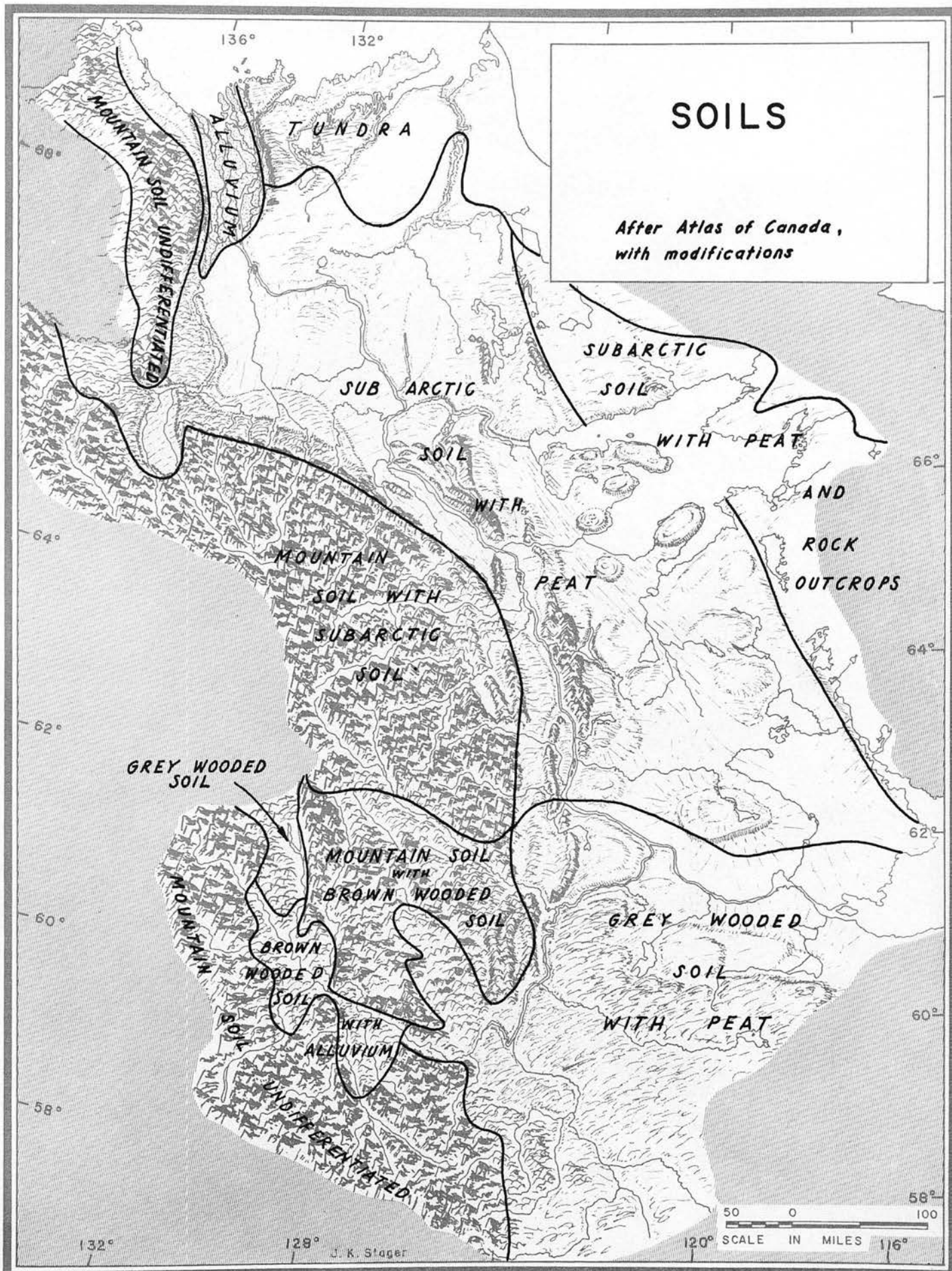
especially if compared to the dense esker pattern on the Canadian Shield (Wilson, 1958). There are some short eskers, mostly near the edge of the shield, and strand lines have been recognized along the shores of Great Bear Lake. Eskers, where they occur, were frequently used as routes because they stood up, sandy and dry above the swampy lowlands. The raised beaches around the lakes were favoured sites for settlement because the excessive drainage often meant lighter timber and dry, open patches were available for camping. In the valley occupied by the Mackenzie River alluvial deposits have buried wide stretches of countryside. The alluvium probably had its origin in the erosion of fresh glacial drift. The river has recently incised its bed in response to uplift of the land readjusting to loss of the weight of ice, and terraces are visible at intervals along the river. The terraces are about 100 feet high near the mouth and rise upstream. The lower of these terraces, near the river, saw strings of Indian settlements and they were often used as sites for the trading posts provided they were beyond the high water level of the river. The larger posts, like Fort Simpson, preferred the broader uplands where there was room to accommodate the post buildings. Large swampy areas are evidence of drained lake basins, and now these lacustrine plains are dotted with thousands of small lakes and ponds. The Lower Rampart River meanders in a tightly serpentine course across the larger of these plains.

The most significant feature of recently developed landforms is, of course, the present Mackenzie delta. The delta is an estuarine type having partly filled in the trough between the Richardson Mountains on the west and the Caribou Hills and Richards Island on

the east. The deposits are fine-grained sands, silts and clay, with organic material in varying quantities. Trapped water contributes over 50 per cent of the bulk sediment volume in some places.

(Mackay, 1956, p. 1; Pihlainen, Brown and Johnston, 1956, p. 4).

This water content is frozen because permafrost underlies the delta. The surface of the Mackenzie delta is a maze of lakes and sinuous channels which bifurcate and rejoin enclosing many small and large islands. It is a bewildering pattern on first sight from the air. At the head of the delta near Point Separation the river breaks into three main channels that lead through the delta; two empty into Mackenzie Bay and a third, the East Channel, cuts between Richards Island and the Tuktuk peninsula to Kugmallit Bay. A great proportion of the delta surface is water covered. In the central third of its north-south extent between 30-50 percent of the land is lake covered. The amount of water surface declines to the north and to the south, and delta lakes become increasingly smaller and more numerous towards the south. (Mackay, 1956, p. 3). So great a water surface and the large numbers of lakes are not well appreciated from travel through the delta by boat which allows only a view of densely wooded banks, in the south at least. The entire delta land is low lying and channel banks are scarcely more than 30 feet above the low water in late summer and this height decreases gently downstream (J.R. Mackay, personal communication). Most of the channels are outlined by natural levees, and these higher and generally well-drained locations are preferred by the coniferous vegetation, so that the illusion of a densely wooded delta is complete. The great number of lakes, fringed as they are with reeds and willow swamps, breed vast numbers



of muskrats, and have made the delta one of the richest fur trading areas in North America. However, the remoteness of the area retarded its exploitation, and in the century under consideration it was of relatively little importance.

Soils

Probably because the Mackenzie region is not now, nor likely to be in the foreseeable future, an area for serious agricultural activity, very little is really known about the soils. Local testing has been carried out at settlements and known relationships of soil development to conditions of terrain, climate and vegetation have enabled one to determine the broad conditions of soils in the region (Map 7). Five basic soil divisions occur. In the south two zonal soils have developed. On the interior plain south of Fort Simpson there is Grey Wooded Soil that is really a transition from the true Grey Wooded Soil further south to Sub-Arctic Soil (Leahey, 1948, p. 458). The transition characteristics are manifest as peat and muck accumulation which become increasingly part of the soil picture towards the north. The peat is often frozen at a shallow depth even though it is south of the line of continuous permafrost. (See Map 13D). Grey Wooded Soil has a well developed podsollic character with greyish middle horizon and near-neutral reaction. In the Liard Plain, Brown Wooded Soils have formed and some Alluvial Soil exists in association with the Liard River and its tributaries. The soils at Fort Liard are neutral tending to basic. (Sanderson, 1948, p. 292). Generally Brown Wooded Soil is associated with calcareous parent materials and is immature. (Rowles, Farstad and Laird, 1956, p. 100). The soils are classed as Sub-Arctic in the central part of the

Mackenzie region. Characteristically the surface layers are composed of partly decomposed moss and leaves, and are quite acid (Leahey, 1948, p. 460). Below, however, the reactions become strongly basic. Permafrost is not continuous in the Sub-Arctic Soil, especially south of Great Bear Lake, but it is definitely one of the characteristics. Near the Canadian Shield, Sub-Arctic Soil is rather poorly represented because of the high percentage of the surface that is bare rock. In addition, peat accumulations increase northwards as conditions for decomposition of organic matter grow steadily worse.

North of the forested areas soils develop in association with tundra vegetation and Arctic climate. Tundra Soils are affected in their development by the continuous distribution of permafrost, and throughout much of the area, the depth of the active layer is quite shallow. Permanently frozen ground permits no development of soil in the agricultural sense. Thus soil profiles are shallow and highly variable because of processes giving rise to the peculiar array of features called generally "patterned ground." Associated with some patterned ground is downslope movement that results in an overturning process that succeeds in rolling under the surface accumulations of organic debris. The whole results in a confused stratigraphic sequence and bewildering soil profiles. (Mackay, Mathews and McNeish, 1961, p. 43).

Throughout the Cordilleran region the soils are classified as Mountain Soils and are so far undifferentiated because the area has high relief and an unexplored variety of mountainous, rocky, steeply-sloping and eroded landscapes. There are numerous pockets of unconsolidated materials in the southern section which have poor



Podsollic characteristics. On the other hand, in the north, the pockets of soil have more the character of the subarctic and tundra zones, but in recognition of the true state of knowledge of the Mountain Soils, they are mapped as undifferentiated.

Azonal Alluvial Soils of recent origin are found on terraces or islands along the main rivers and tributaries. As yet they have not developed any characteristic profiles because of their recent origin and the existence of permafrost. The best example is the Mackenzie delta which is the largest area of alluvium in the entire region; these soils are the most fertile in the Mackenzie region, and, considering their accessibility compared to other soil zones, hold the greatest agricultural potential. (Leahey, 1948, p. 459). They were useful in helping the factors at the trading posts develop quite extensive and valuable vegetable gardens that gave much needed fresh greens and potatoes to alleviate the diet of meat and imported flour that **was** the traders' mainstay. The use of gardens, and in some cases small farms with grain and hay became more important in the second half of the nineteenth century.

CLIMATE OF THE LOWER MACKENZIE REGION

Vast areas of the northern part of Canada, including most of the Mackenzie Region, have climatic conditions that are commonly and conveniently described as Sub-Arctic. The connotation corresponds to Köppen-Geiger classification Dfc and means simply that the winters are very cold with at least one winter month having a mean temperature below 26.6°F and at least one summer month above 50°F. The notation also indicates that summer is a short season while winter can be rather long and severe. Precipitation is adequate but not abundant. In the Mackenzie region the northern boundary of Sub-Arctic climate extends to the delta, and in absence of a good network of weather observation posts, the character of the vegetation can well indicate the Sub-Arctic limits. The map of Vegetation (Map 17) displays both forested and non-forested terrain, and as a gross generalization, one can mentally substitute Sub-Arctic climate for forested regions. The non-forested areas are coincident with Arctic climate - Köppen-Geiger E.T. Such a climate has come to mean that no month has a mean temperature above 50°F but there is a short summer when at least one month has a mean temperature above freezing. Arctic climate is a response to atmospheric conditions that are found in both high latitudes and at high altitudes. Consequently, the arctic coastal plain and the alpine highlands are the areas with both cold winters and cold summers.

The main control for the climatic characteristics of the region are the air masses which dominate the Mackenzie valley. Topography affects the movement of air masses, and latitude contributes to their temperature characteristics. Also the amount of open water, both

sea and lakes, has an influence upon the humidity of air masses.

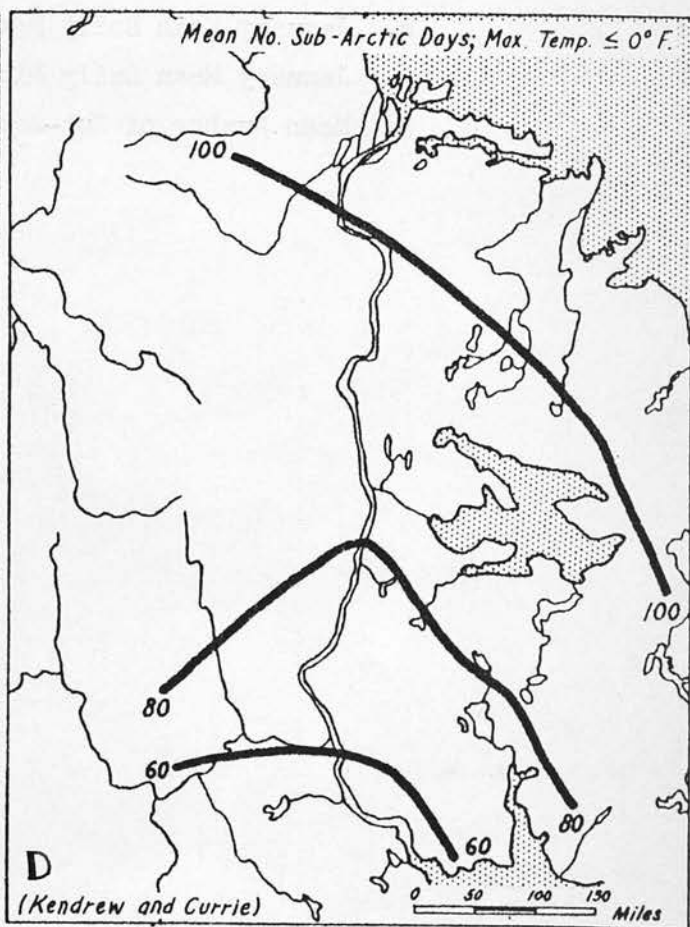
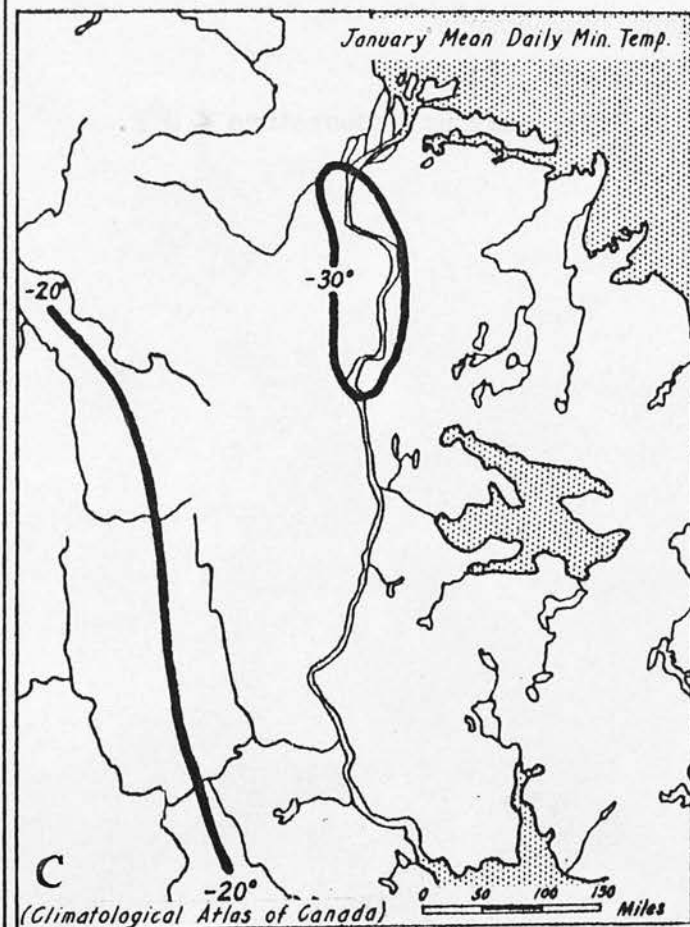
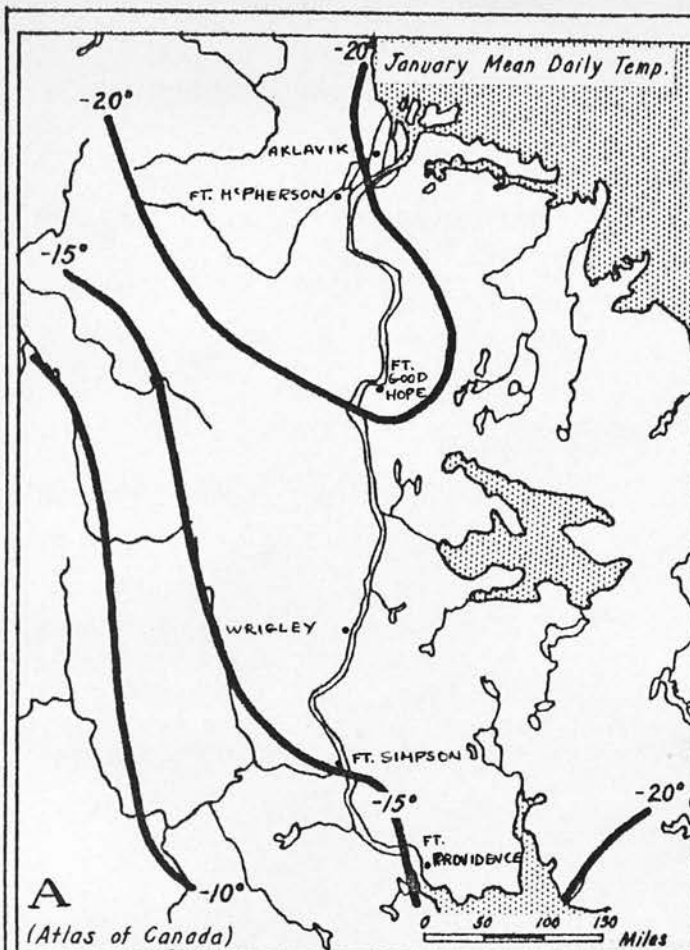
Once winter has established itself, the Beaufort Sea is more or less covered with ice and the combination of islands and ice to the northeast effectively converts a large area from moisture-giving water surface to dry land conditions. Air over this large region assumes cold, dry and stable characteristics, and persistently dominates the entire Mackenzie Lowlands for long periods of time. Sub-zero temperatures with little or no snow accompany the dominance of this Arctic Air Mass.* Over the Behring Sea the air is cold but more humid. Occasionally this Polar Maritime Air Mass penetrates the Mackenzie region, rarely along the coast, but more often by overtopping the Mackenzie and Richardson Mountains. When it does, it brings precipitation and sometimes, when conditions are favourable, it creates a warming of the air east of the mountains in the form of a "Chinook" or "Foehn". The air mass from Behring Sea gives slight variety to the climate of the Cordillera. In winter, air from the Pacific may bring warm moist conditions from the Gulf of Alaska across the mountains into the Mackenzie region; it rarely happens because of the effective defence against it by the wide belt of mountain ranges, each of which takes their toll of moisture as the air rises to pass over. The invasion of Pacific air can also cause Chinooks all along the eastern front of the mountains north as far as the delta, and when this milder air is accompanied by a shrinking of the Arctic Air Mass, the resulting southeasterly flow can cause prolonged mild spells in the Mackenzie Lowlands.

* All temperatures are in degrees Fahrenheit.

In summer when the middle latitude storm tracks move northward, and the water surfaces become free of ice, other air masses affect the Mackenzie region. Air over the Beaufort Sea remains cool and although it has more moisture than in winter, it does not produce heavy precipitation. When this air moves inland it is warmed by the land surface and unstable conditions develop so that cloudiness is common, and if the air has absorbed much moisture from the many lakes, convectional rainfall with thunderstorms result. Storms from the Pacific Ocean usually pass north through Alaska or along the coast, but may be drawn up the Mackenzie Valley by the cyclonic circulation associated with thermal heating over the interior of the continent. Both these conditions make for unsettled weather in the summer, greater cloudiness and a definite summer maximum in precipitation. When the Arctic Air is not affected by Pacific storm incursions, its relative dryness permits clear skies and much warming over the land. Locally, however, where there are large lakes, like Great Bear and Great Slave Lakes, temperatures are a few degrees lower because of the cooling water. A similar effect is much more noticeable along the sea coast. Arctic ocean water is cold and although the floating ice pack retreats north, winds often drive ice onshore west of the Mackenzie mouth. Ice and cold water prevent the air from becoming warm and the effect of the cold ocean influence is reflected in the extent back from the coast of Arctic Climate and mature tundra vegetation.

Air Temperature.

Northern climates are frequently represented as having only two seasons, summer and winter. Between these there is supposed to



be a rapid transition. Observation of the air temperature records in the Mackenzie Valley show this is not the case along the length of the river. Instead there are four distinct seasons as there are in southern Canada.

Winter

The winter months, December, January and February, are distinguished by low temperatures and by the very slight change from month to month. No place in the valley has a range of monthly mean daily temperatures more than 8° during winter.* Aklavik winter temperatures vary only 2° (Dec. - 16° , Jan. - 18° , Feb. - 17°). Fort Providence at the south end of the region has the largest range of 8° (Dec. - 9° , Jan. - 17° , Feb. - 13°).

In addition to the impression of winter as cold and uncompromising as seen in the average temperatures for that season, it is important to consider how air temperature may depart from this average. Temperatures as low as -69° have been observed at Fort Simpson and -79° was recorded once at Good Hope. These temperatures are record extremes, and not as meaningful as the mean daily minimum temperatures in the valley which are around -24° . (Aklavik, Dec. -24° , Jan. -26° , Feb. -24° ; Fort Simpson Dec. -19° , Jan. -23° , Feb. -19°). Mean daily maximum air temperatures are 16° to 17° above mean daily minimums; for example, Fort McPherson shows the following:

Dec.	-	mean daily min.	-23°	mean daily max.	-8°	mean diurnal variation	15°
Jan.	"	"	-30°	"	"	"	17°
Feb.	"	"	-23°	"	"	"	17°

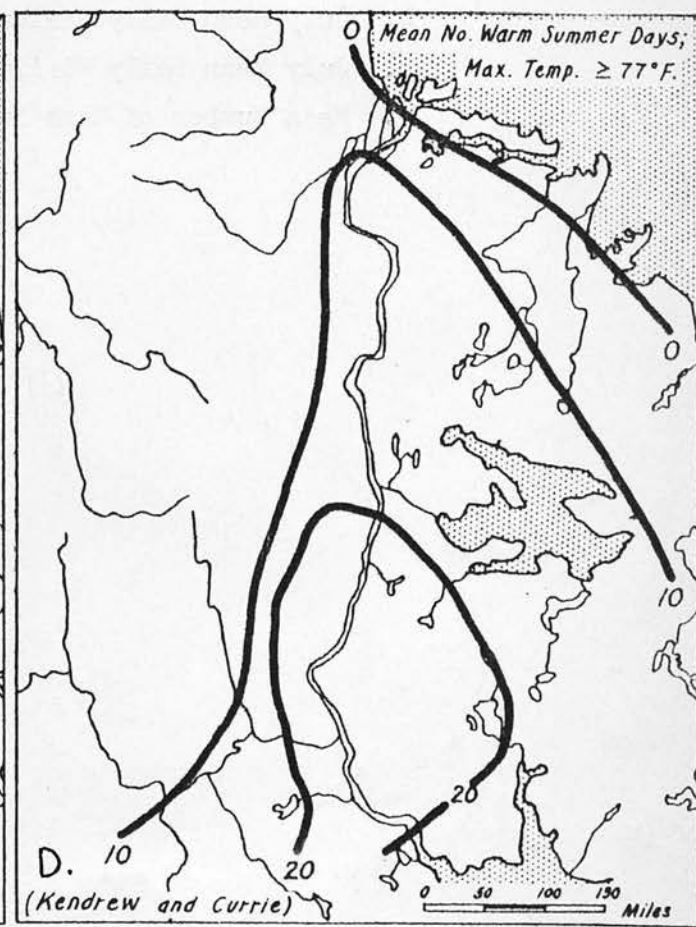
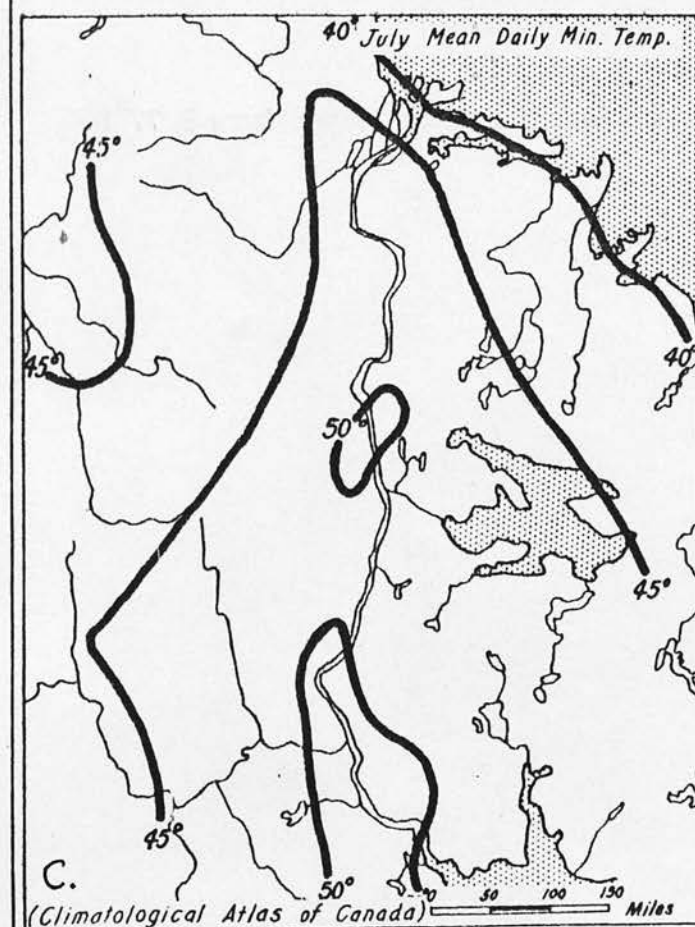
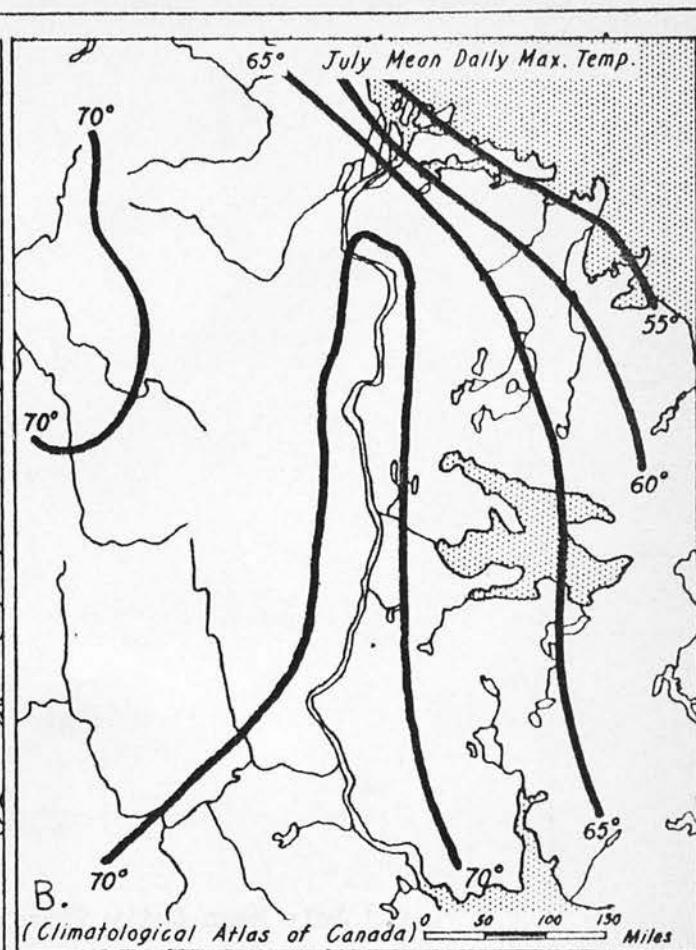
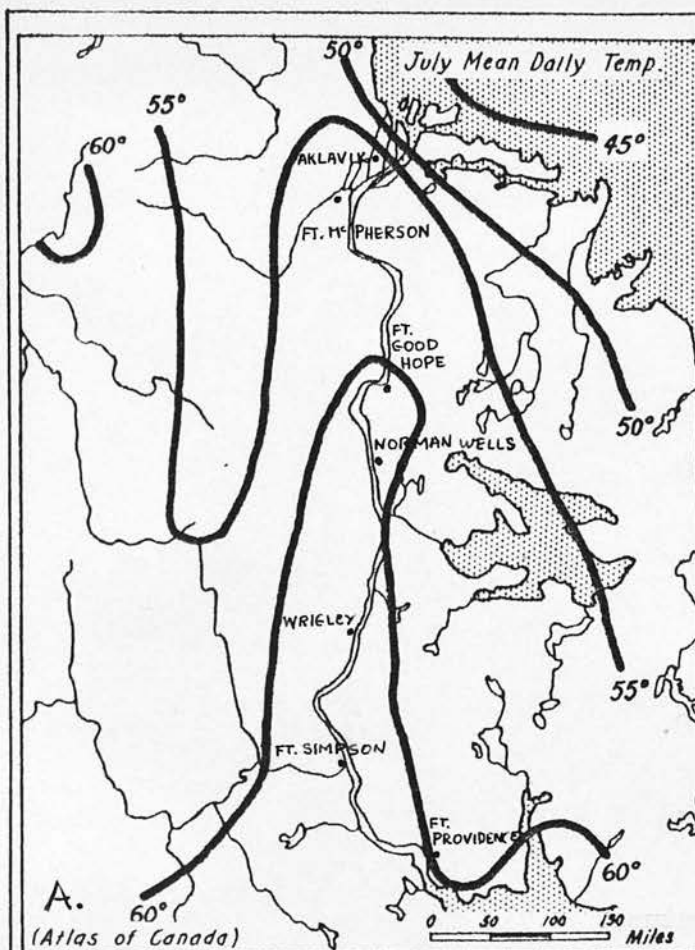
* Unless otherwise indicated, the source for all temperature data is Climatic Summaries Vol. I, published by Meteorological Division of Canada's Department of Transport.

The southern half of the Mackenzie region shows the same pattern.

Consider Wrigley:

Dec.	-	mean	daily	min.	-21°	mean	daily	max.	-8°	mean diurnal variation	13°
Jan.		"	"	"	-27°	"	"	"	-10°	"	17°
Feb.		"	"	"	-21°	"	"	"	-4°	"	17°

The pattern of January temperatures may be taken as representative of winter (Map 8, A.B.C). One outstanding characteristic is apparent from the maps, and this is the fact that little variation in winter air temperature is evident from one end of the region to the other despite a latitudinal range of nine degrees. Slightly warmer air seems more frequent in the southwest where Pacific air makes itself felt. A second feature of the air temperature pattern is the cold pocket from Fort Good Hope to the delta. Cold air drains downslope, and along the river colder temperatures occur. The cold region is a natural basin in which cold air accumulates and it would probably extend to the coast were it not for some heat loss to the air through the ice and open leads. The map showing the mean temperature values does not show how much the variation occurs from year to year. This is particularly true in winter. For example, at Fort Good Hope the average difference between pairs of successive Januarys is 11°. (Kendrew and Currie, 1955, p. 78). It can be seen, therefore, that winter is likely to differ very much from one year to another, and such variability has brought uncertainty and often disaster into the life of native man. The length and bitterness of the Sub-Arctic winter also helps make this season precarious for inhabitants of the region. Map 8D, shows the mean number of days when air temperature never rises above 0° and this happens from one-sixth to more than



one-quarter of all the days in the year. Thus a substantial proportion of the life of native man must be spent under conditions of extremely low air temperature and for him winter is the most important season.

Summer

Like the winter, the summer months of June, July and August do not have markedly different air temperatures. In the valley the range of monthly mean daily temperature is never over 7° . Aklavik has a 7° span (June 49° , July 56° , August 50°); Norman Wells varies only 6° (June 57° , July 61° , August 55°); Fort Providence also has a 6° range (June 54° , July 60° , August 58°).

There is, during the summer, a greater range between the mean daily minimum and mean daily maximum temperatures than occurs during winter. Greater air mass mobility and modification is characteristic of summer and accounts for greater diurnal variation in received insolation and more extreme air temperature conditions. Take for example a northern station, Fort McPherson:

June mean daily min.	44°	mean daily max.	64°	mean diurnal variation	20°
July " " "	50°	" " "	68°	"	18°
Aug. " " "	45°	" " "	63°	"	18°

and a southern station - Wrigley:

June mean daily min.	46°	mean daily max.	69°	mean diurnal variation	23°
July " " "	49°	" " "	74°	"	25°
Aug. " " "	45°	" " "	68°	"	23°

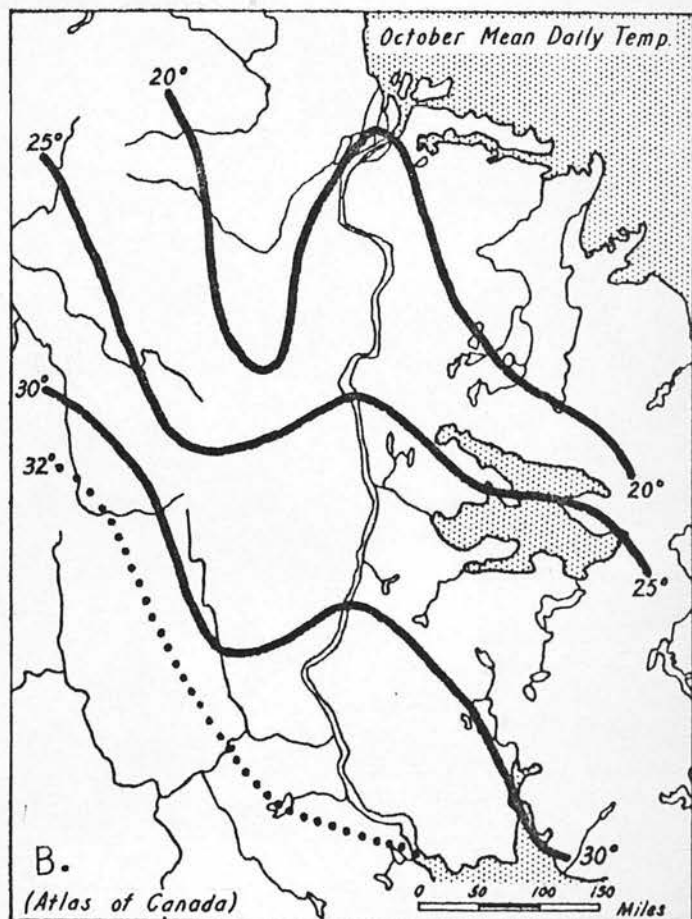
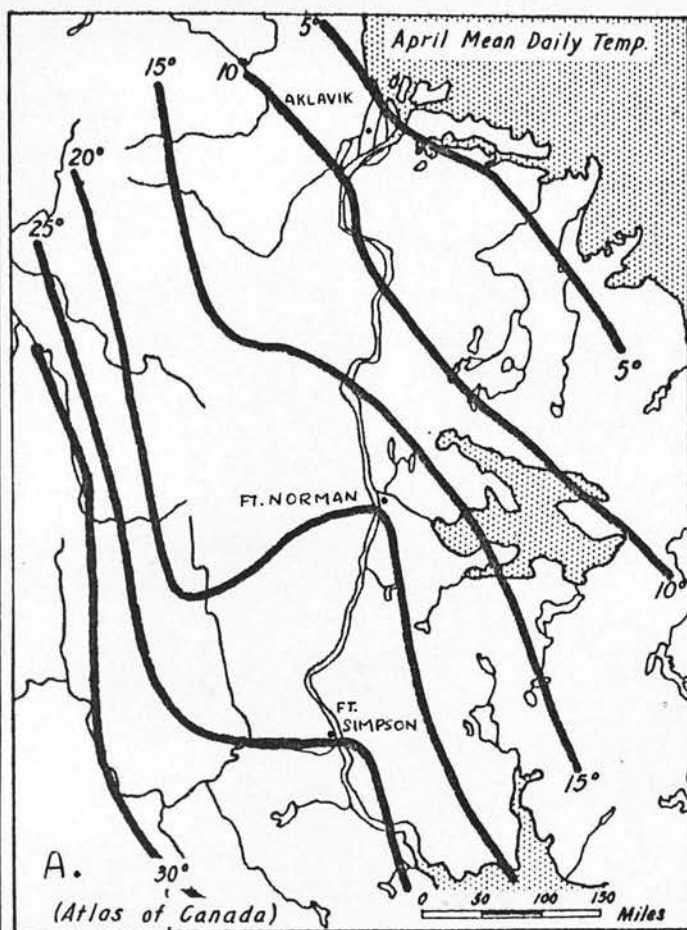
Absolute extreme temperatures are, of course, beyond the mean daily ranges and a high temperature of 95° has been recorded at Fort Good Hope and at Fort Simpson. Even Aklavik on the edge of the Arctic Ocean has recorded 93° . Thus the average pattern of summer temperatures

shows a wider range of mean values than winter, but the pattern is more dependable from one year to the next than during winter conditions. At Good Hope the average difference between pairs of successive Junes is only 3° . (Kendrew and Currie, 1955, p. 78).

July air temperatures taken to represent the summer of Mackenzie region are shown on Map 9 A, B, C. Except next to the Arctic Ocean there is little difference in temperature from the south to the north. Instead of a latitudinal gradation, it is more meridional with the air next to the surface becoming colder with altitude towards the west, and cooling to the east as the maritime influences of Hudson's Bay become stronger. The land around the margins of the great lakes is noticeably cooler because of these bodies are filled with ice until late June, and water in the upper Mackenzie draining from Great Slave Lake cools the air immediately next to the banks. In the gross pattern of temperature for the region this is not significant, but it is significant for natives who lived along the river and for white men who later tried to cultivate the land. Despite this cooling, there are a surprising number of warm summer days when the high temperature of the day is at or above 77° (Map 9D). In the upper Mackenzie region more than 20 days are hot, but towards the coast, such high temperatures are exceptional.

Transition Seasons

The transition between the persistent and intense cold of winter and the summer warmth takes place over three months in spring and again in the three months of autumn. Commonly the transition seasons in the Mackenzie region have been styled as being of only two months duration because the months of March and November display



the characteristics of winter and have been regarded as belonging to that season. (ibid., p. 77). Nevertheless, a case can be made for transition periods of three months each.

Spring Transition: This is the season that is marked by rapid increase in air temperature from a mean daily temperature of -15° to -20° in winter to the warmer weather between 50° and 60° in summer. It is a striking change and the speed with which it is accomplished may be seen from the following table:

Mean daily temperatures and differences between successive months at Aklavik, Fort Norman, and Fort Simpson.

Month	Aklavik	Diff.	Ft. Norman	Diff.	Ft. Simpson	Diff.
February	-17°		-13°		-9°	
March	-8°	9°	-1°	12°	4°	13°
April	9°	17°	19°	18°	25°	21°
May	31°	22°	42°	23°	45°	20°
June	49°	18°	55°	13°	57°	12°

The three stations representing the north, middle and south of the Mackenzie region show that the rate of change of daily temperatures is about the same along the whole length of the river. Also, the change in mean daily temperature from February, a winter month, to March is between 9° and 13° for stations of the table. This is a big change compared to the change from January to February at Aklavik (1°), or Fort Norman (4°) or Fort Simpson (4°). Certainly during the month of March the end of winter, according to air temperature, has begun even though the temperatures are still cold and native activity increases over the general dormancy of deep winter. The same is also true concerning the arrival of summer. The increase in mean daily temperatures from May to June in the table may be as much

as 18° at Aklavik, or around 12° farther south. It is a great change compared to that between June and July (Aklavik 7° , Fort Simpson 3°). The conclusion is that summer has arrived in June and that the month of May is still in the transition season even though the daily temperature approaches the summer warmth.

The pattern of air temperature representing the spring transition can be seen on Map 10A. Even spacing of the isotherms with east-west orientation shows the influence of latitude. It is only during the transition season that a zonal pattern of temperature distribution is apparent in the valley. In spring the mean daily temperature decreases northward about 2° per degree of latitude.

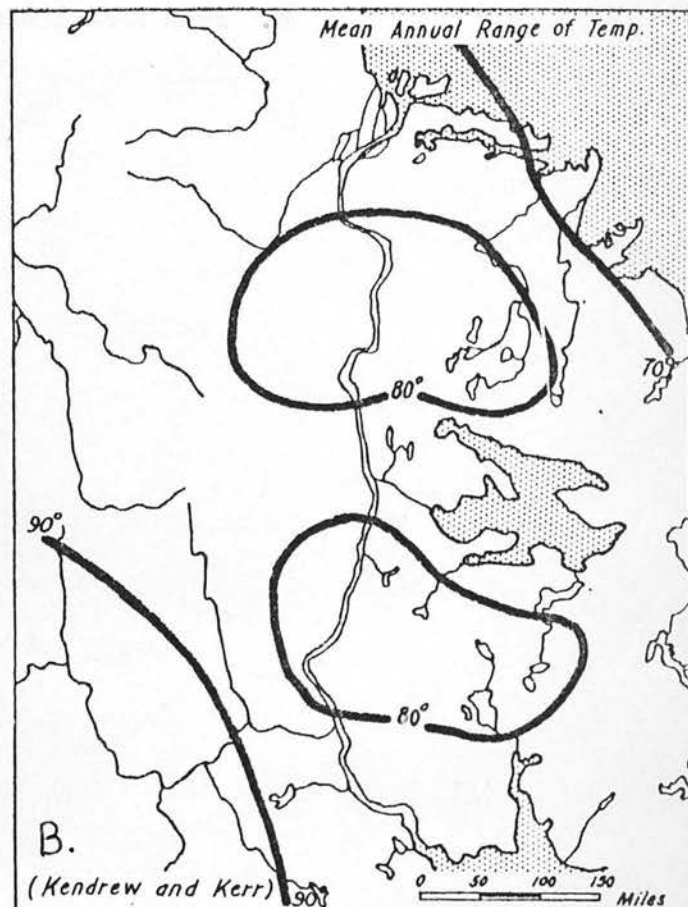
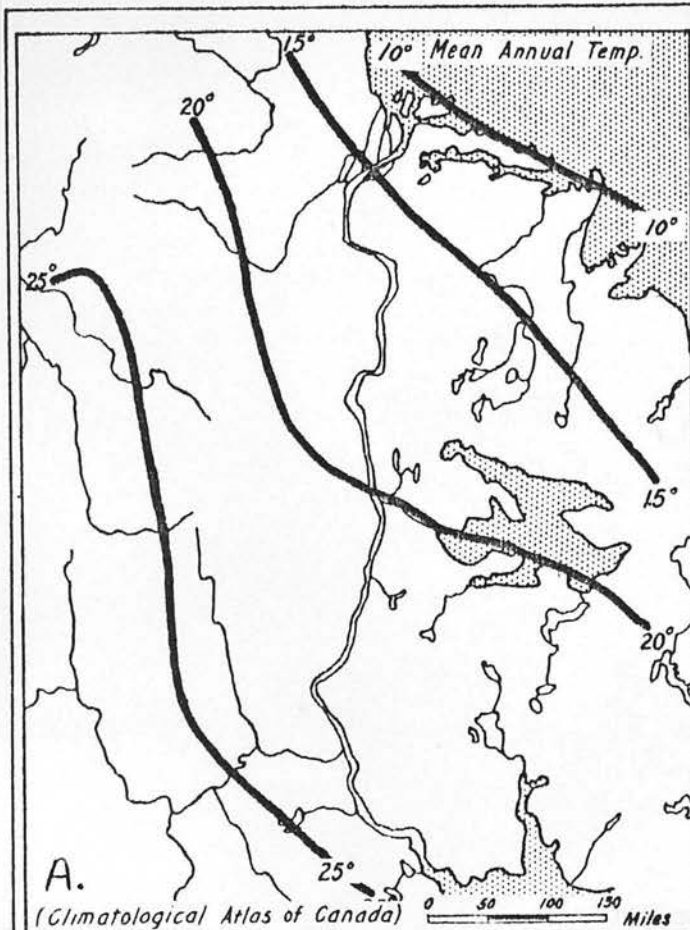
The transition to summer was an important season for the Indian people because climatic conditions of spring and summer presented a vastly different land with flourishing vegetation, open waterways and migrating animals and birds. This new environment had to be prepared for and the transition seasons were marked by activity such as canoe building, tent and summer clothing preparation and the like. Also, people began to move to various localities better suited to their support by summer fishing or hunting. The climatic influence was very strong in the rhythm of native life and the topic is considered later in greater detail.

Autumn Transition: As would be expected, the autumn transition season is the reverse of spring with some minor differences. The following table shows the rate and extent of change in the monthly mean daily temperatures.

Mean Daily Temperatures and differences between
Successive months for Autumn at Aklavik, Fort
Norman and Fort Simpson.

<u>Month</u>	<u>Aklavik.</u>	<u>Diff.</u>	<u>Ft. Norman.</u>	<u>Diff.</u>	<u>Ft. Simpson.</u>	<u>Diff.</u>
August	52°		54°		58°	
September	38°	14°	42°	12°	47°	11°
October	20°	18°	26°	16°	31°	16°
November	-13°	23°	0°	26°	6°	25°
December	-16°	13°	-14°	14°	-11°	17°

Aklavik, representing the northern end of the Mackenzie region has a slightly more even transition of air temperature from August to December than occurs in the south. It is not completely even, for throughout the valley there is a big change from October to November. The difference in the mean daily air temperature from August to September are of the order of 12° along the river and is a clear indication that transition to winter has begun. These are much less than the differences between July and August which are about 5°. August is, therefore, the latest summer month. November, usually regarded as a winter month because of low temperatures, is here included in the transition season because a progressive lowering of temperature continues through November until winter temperatures are reached in December. The decrease in mean daily temperature from November to December as indicated in the table is between 13° and 17°. On the other hand, the change from December and January, in winter, is never more than 6° and is closer to 4° throughout the valley. If the extent of temperature changes is the criterion for a transitional period, then November clearly belongs to this season.



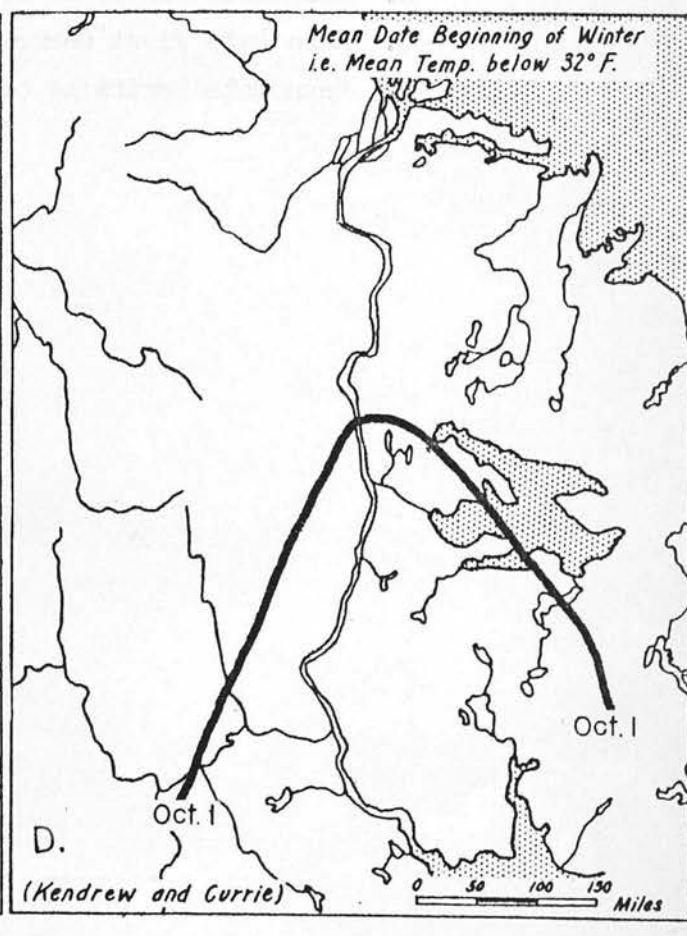
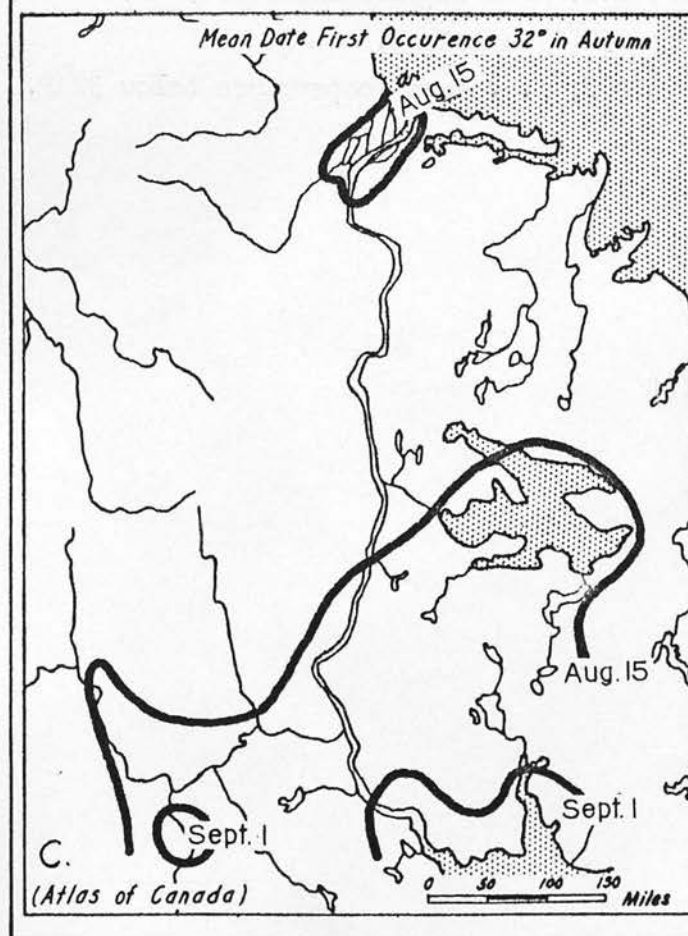
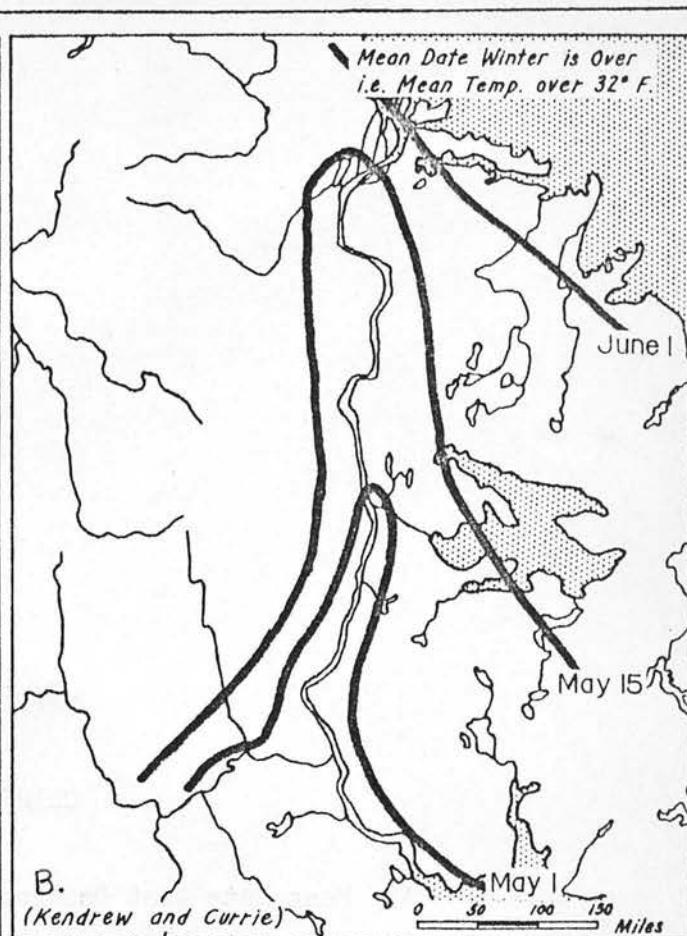
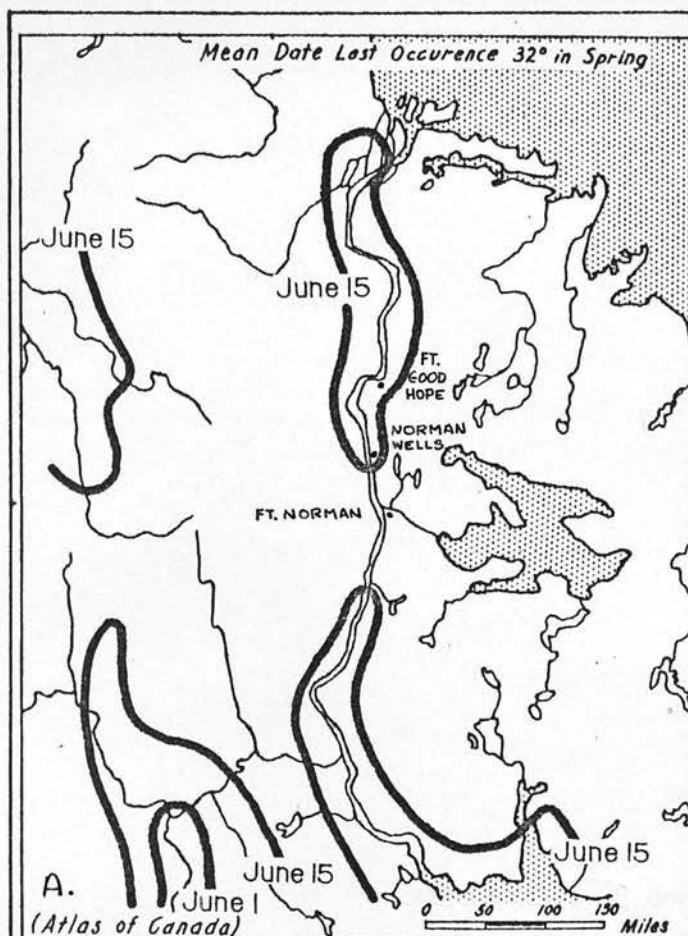
Once again the pitch of native life is much higher in the autumn transition than in the subsequent winter.

Like spring, autumn also shows the influence of latitude upon air temperature. On Map 10B, the isotherms are evenly spaced, and trend east-west in October. The temperature gradient decreases northward between 1.5° and 1.7° for each degree of latitude and is smaller than the spring gradient. In fact, overall October temperatures in the Mackenzie region are several degrees higher than April, the mid-month of spring transition.

Like the spring, the autumn transition was a time of preparation for coming winter. Various adjustments had to be made to meet the low temperatures both with clothing and shelter, and to meet much different travelling conditions. Therefore, native activity took account of the impending season. The importance of the autumn transition both before and after the coming of the fur trade are explained later in the thesis.

Annual Temperatures:

Map 11A shows the pattern of mean annual temperature for the Mackenzie region. These values ranging from 25° in the south to 10° in the north sum up the effects of all seasons and clearly shows latitudinal control. However, if the map could be viewed on the continental scale, it would be apparent that the temperatures in the Mackenzie region are higher than those at similar latitudes elsewhere in North America. Map 11B also gives the mean annual range of temperature which, at about 80° , is greater than other parts of the continent at the same latitude and emphasizes the continentality of temperature characteristics in the area.



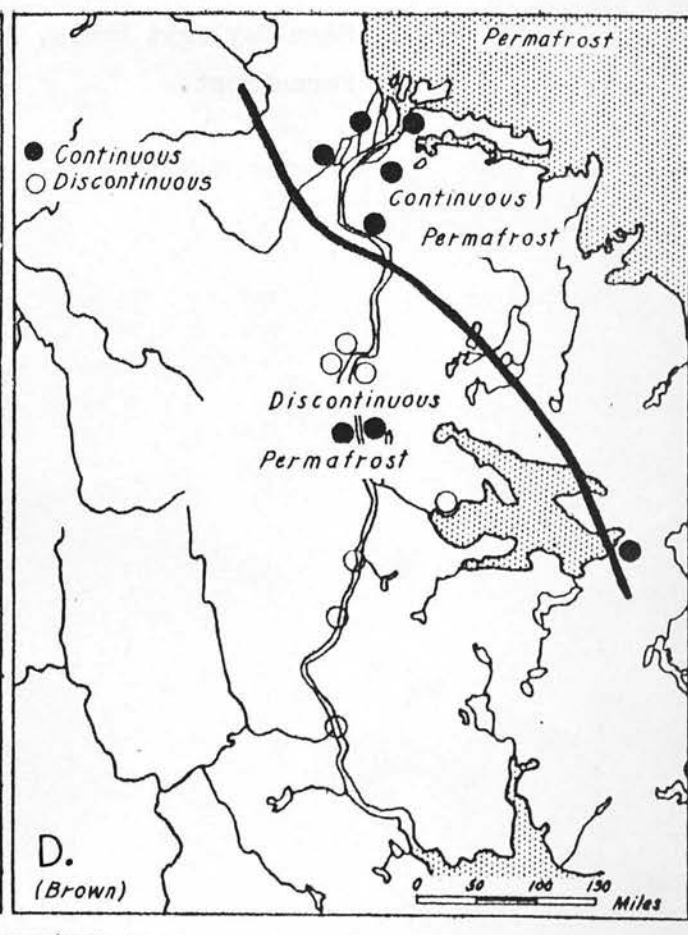
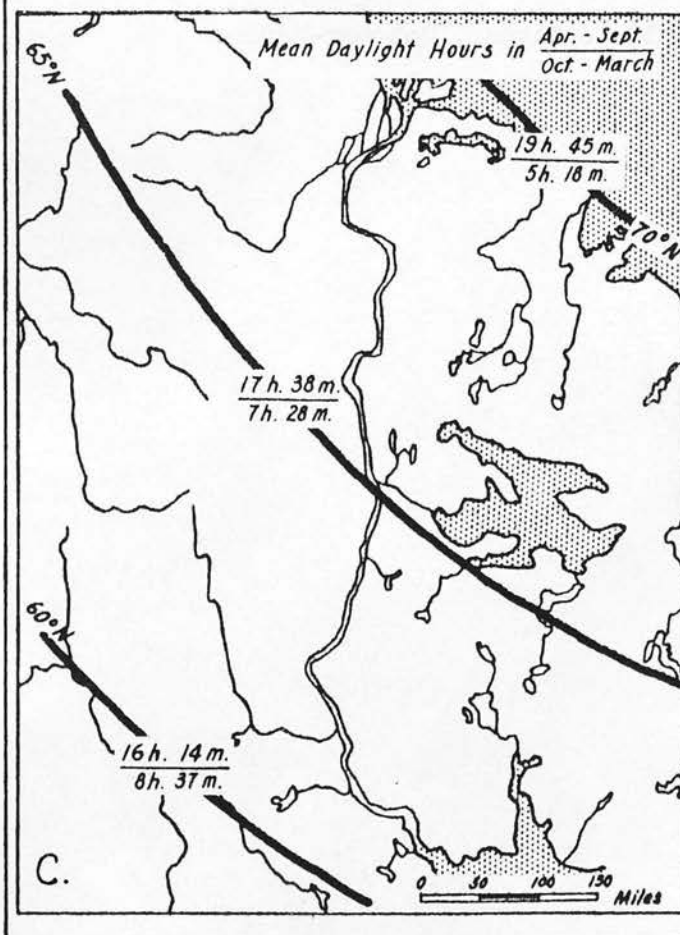
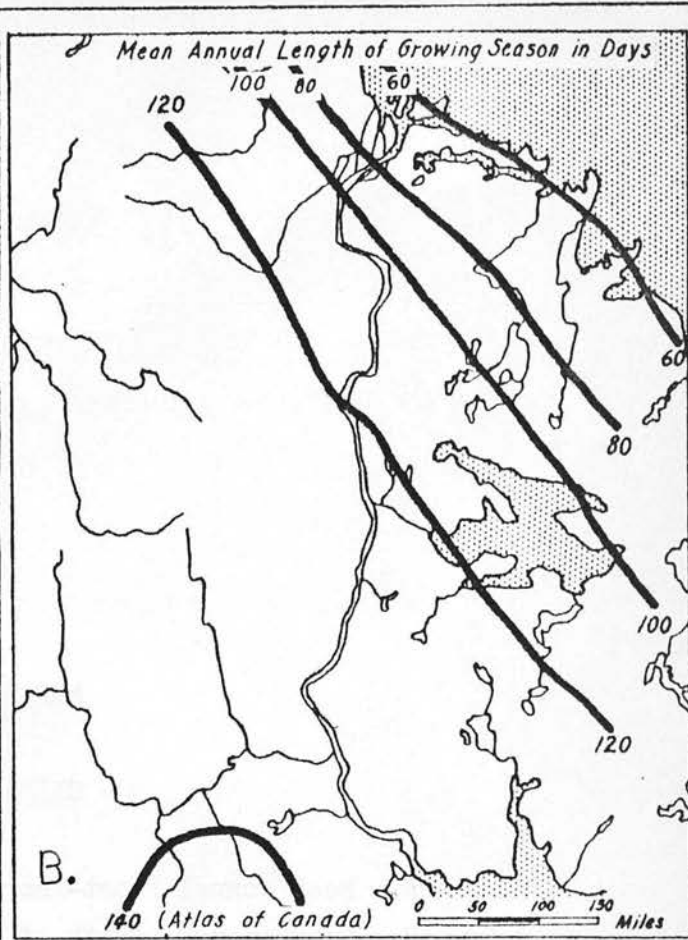
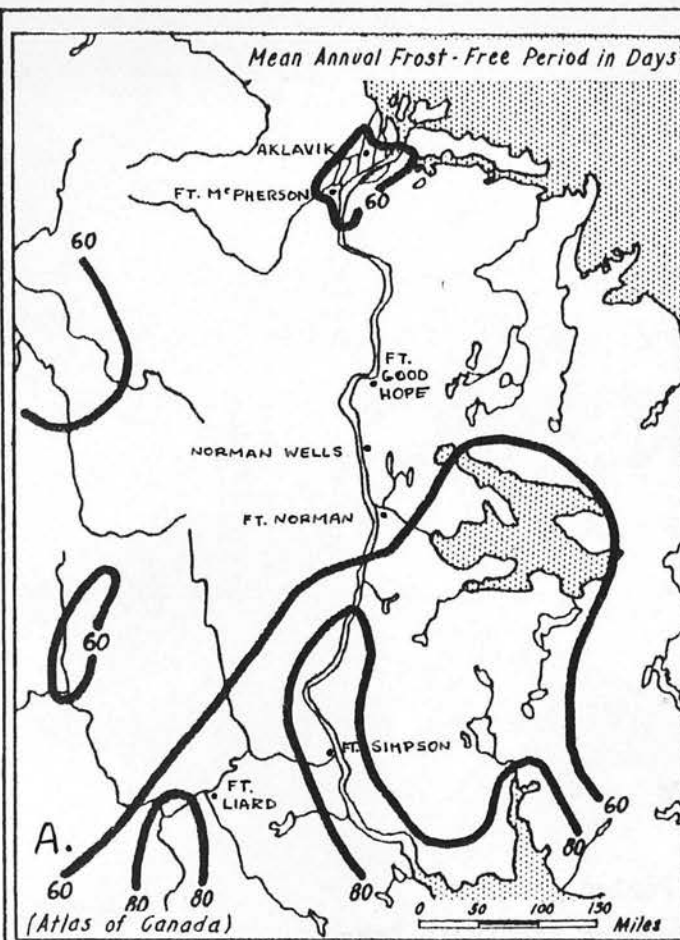
Other Critical Aspects of Air Temperature:

The seasons defined as they have been, one of intense cold, one of surprising warmth, and two transition seasons, do not bring out other critical aspects of air temperature in the Mackenzie valley. During the transition seasons, the changing air temperature crosses two values that are important to life in the region. One temperature is 32° which, when the air temperature rises above it, gives rise to the melting of accumulated winter snow, and the ensuing break-up of river and lake ice. In autumn when air temperatures begin to drop below 32° the process is reversed and soon freeze-up completes the seasonal cycle. The intervening period is the Frost-Free Season, one of the most important in the life of the region.

Frost-Free Season:

The mean date for the last occurrence of 32° in spring is shown in Map 12A. Most of the Mackenzie valley is frost-free by the middle of June except a middle stretch along the river north of Norman Wells. The upland region of either side of the river may have frost recurring later in the same month. This is in contrast to the pattern of mean daily temperatures which for most of the valley have been above 32° since mid-May and in the southern portion of the valley since the first of May (See Map 12B). Thus, although mean daily temperatures are above freezing for much of May and all of June, frost can be expected in the same period. In some years frost has not been felt past the last week in May, but on other occasions it occurred as late as mid-July.

Just as frost persists after the mean daily temperature rises above the freezing point, so it may strike in the autumn well before



the mean daily temperature sinks below 32° . North of Norman Wells, the mean daily temperature is below freezing by October 1. In the southern end of the valley, this temperature arrived, on the average, some time in the next fortnight (Map 12D). By this time night frosts are common all along the river. In the delta frost does not usually arrive until about August 20th, and this late mean date is determined by the water-covered surfaces in the vicinity. Along the river, however, frost may come earlier. Good Hope has frost first on the average about August 6th. Fort Norman has frost usually on August 7th. However, the southern end of the valley may not have frost until toward the beginning of September (Map 12C). There have been in the recorded past wide departures from these means. Sometimes frost has occurred during the 3rd week of July; sometimes it has been as late as the first or even the second week in September.

Just as the last spring frost and first autumn frost are very variable in their occurrence, so the intervening period of Frost-Free days fluctuates greatly. Map 13A shows the mean Annual Frost-Free Period for the Mackenzie region. Apart from the longer 80-day freedom from frost in the southern end of the valley, about half of the region can expect 60 days, plus or minus a few days, without the threat of frost. But this period is really very variable; for example at Fort Good Hope there may be as few as three or as many as 98 frost-free days (Kendrew and Currie, 1955, p. 80). The great fluctuation of frost has probably done more even than intractable soils to discourage agriculture, and to make the Mackenzie pre-eminently a hunting and fishing area.

Growing Season:

Forty-three degrees Fahrenheit has become accepted as the mean daily temperature at which plant growth begins in temperate latitudes (Klages, 1949, p. 239). Map 13B gives the pattern of growing season in the Mackenzie region. This map, compiled from data which assumed the growing period to take place above 42° , represents the mean annual number of days when the mean daily temperature was over 42° , as estimated from a smoothed annual course of temperature for a period 1920-1951 (Atlas of Canada, 1958, plate 24). From Norman Wells south, the valley has 120 to 140 growing days, and between 100 and 120 days from Norman Wells north to the delta. As the distance from the coast and Beaufort Sea becomes less, there is a reduction in the growing season to less than 60 days on exposed points and peninsulas. These days with growing temperatures are not necessarily continuous; frost, and cold days may interrupt. During the 11 year period 1940-1950, Fort Simpson had, on the average, 101 continuous days of growing temperatures. Fort Norman, for the same period, had 92 days; Fort Good Hope experienced 89 days, while Fort McPherson had an average of 74 and Aklavik 66 continuous growing days. Again, these short periods of growth have greatly inhibited the spread of agriculture in the region, and have helped, by contrast to maintain hunting and fishing as the most important economic activity.

Length of Day:

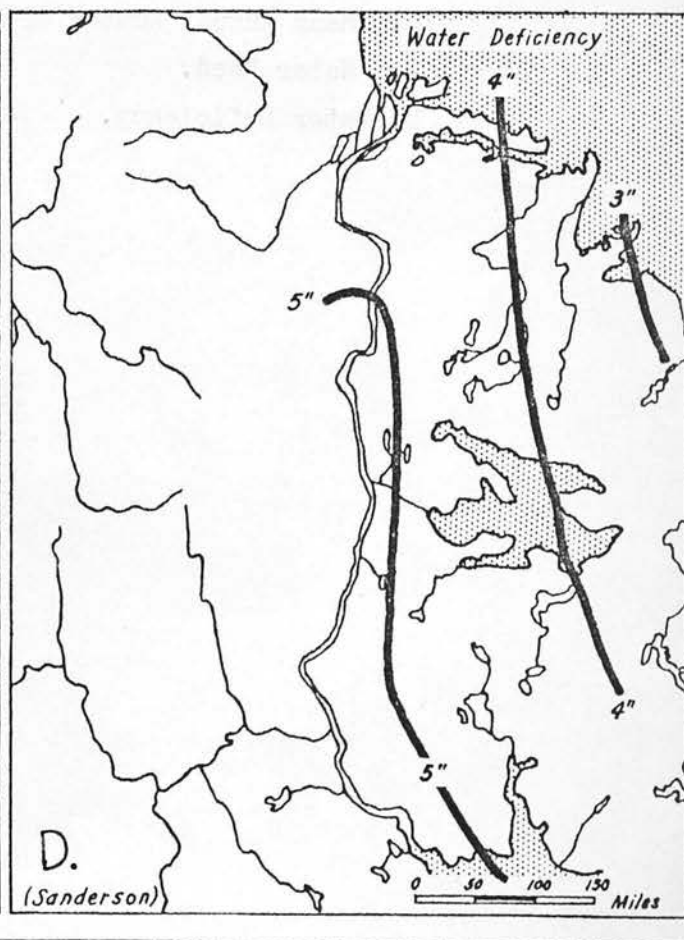
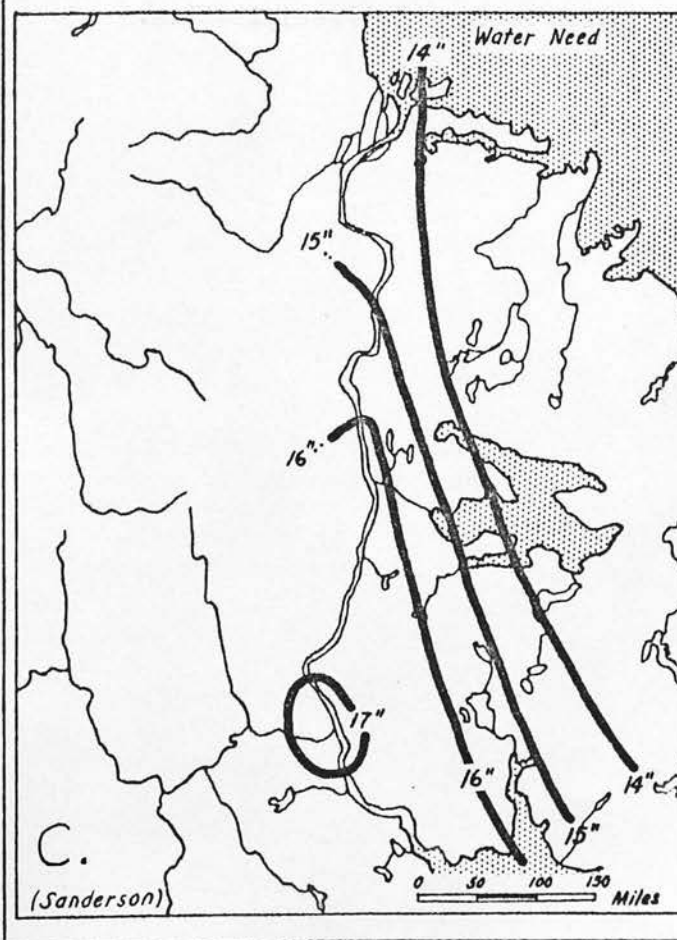
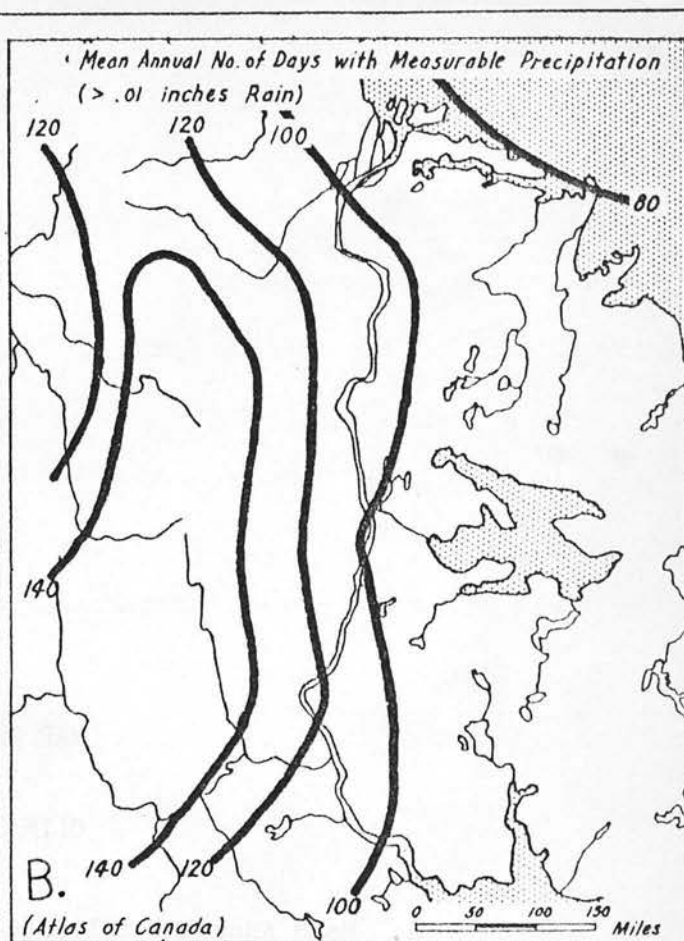
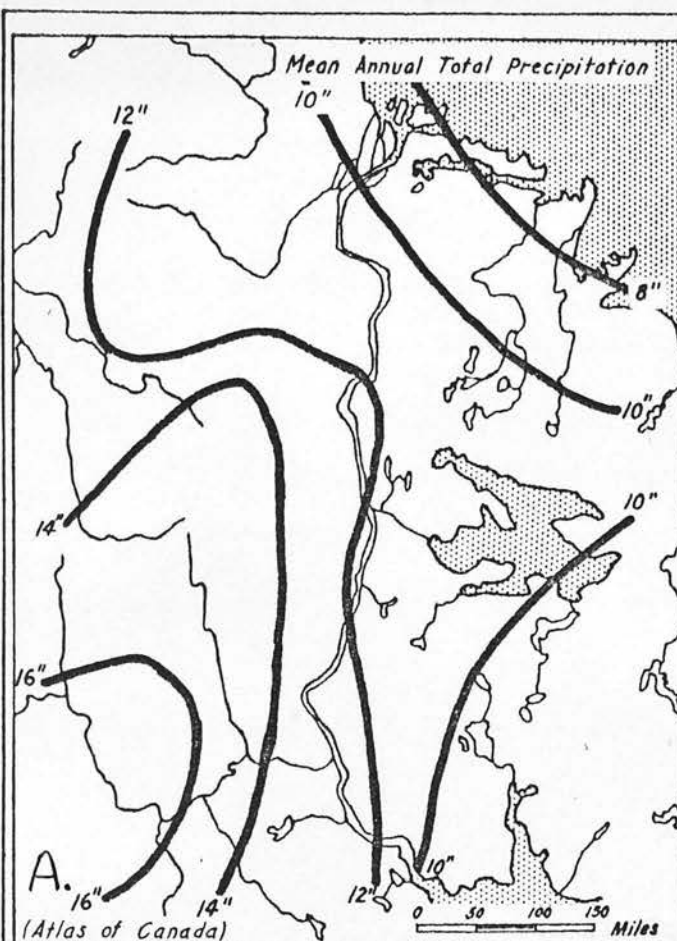
Fort Good Hope is just about on the Arctic Circle and all places north of this have both 24 hours of daylight at mid-June and 24 hours of darkness at mid-December. At Aklavik in winter the sun does not rise between December 9th and January 3rd, and for the dark

period, October to March inclusive, the delta and coastal area have on the average only just over five hours of daylight each day (see Map 13C). The depressing total darkness of mid-winter and the short days are limiting factors in the mobility of the native inhabitants. During this season moonlight and light from aurora are necessary to the business of living. Continuous daylight in mid-summer is a great contrast. The sun is constantly above the horizon from June 8th until July 3rd at Aklavik, and the other summer days are also long. Along the coast the average length of daylight from April to September inclusive is over 19 $\frac{1}{2}$ hours. Long days give great flexibility to native man's habits in summer for daylight permits him to travel and hunt almost at will. The long days are in a large measure responsible for the success of gardening in this northern latitude and permit success where an otherwise short growing season might mean failure. With the long days the rate of growth is phenomenal and even at Aklavik good gardens of lettuce, carrots, cabbage and potatoes bear a rich yield.

South of the Arctic Circle the general pattern remains the same except that the sun sets and rises every day. At Fort Norman the average winter day has only seven and a half hours of light, but the average summer day the sun is up 17 $\frac{1}{2}$ hours. At Fort Liard winter days average eight and one-half hours and summer days 16 $\frac{1}{4}$ hours.

Permafrost:

Native man in the Mackenzie region was with few exceptions never very concerned about whether the ground was permanently frozen or not. Perhaps indirectly insofar as permafrost would affect burrowing animals or the growth of trees it would also have some bearing upon



man's activity. When the traders came, the "heave and thaw" action above the permafrost became noted, since it often led to sagging doors and windows and buckling floors at the early posts. In modern times permafrost is of considerable importance especially to construction in the north, as air-strips and government building have grown in significance. Air temperature has an overall influence upon the distribution of permanently frozen ground, but it has been shown that other factors such as the type of soil and vegetation, and geothermal considerations are important (Brown, 1960). Map 13D shows the boundary between continuous and discontinuous permafrost and the locations of some test borings upon which the boundary is based.

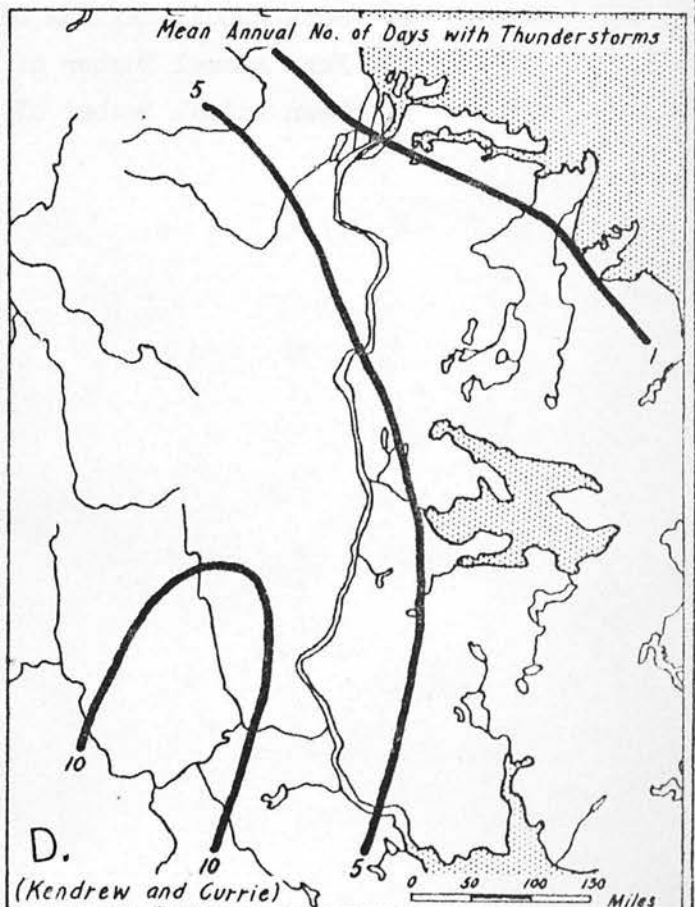
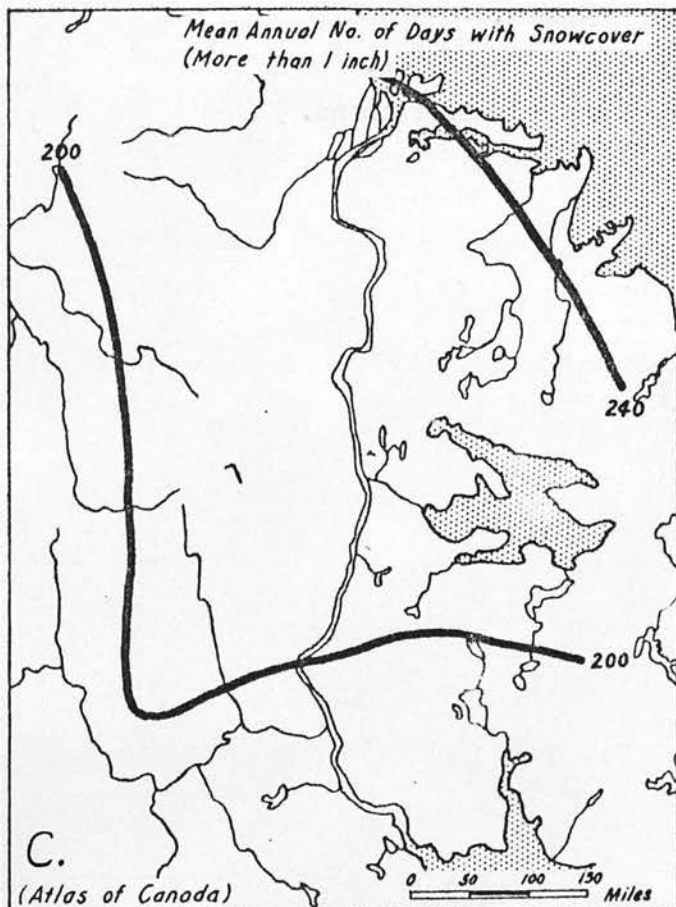
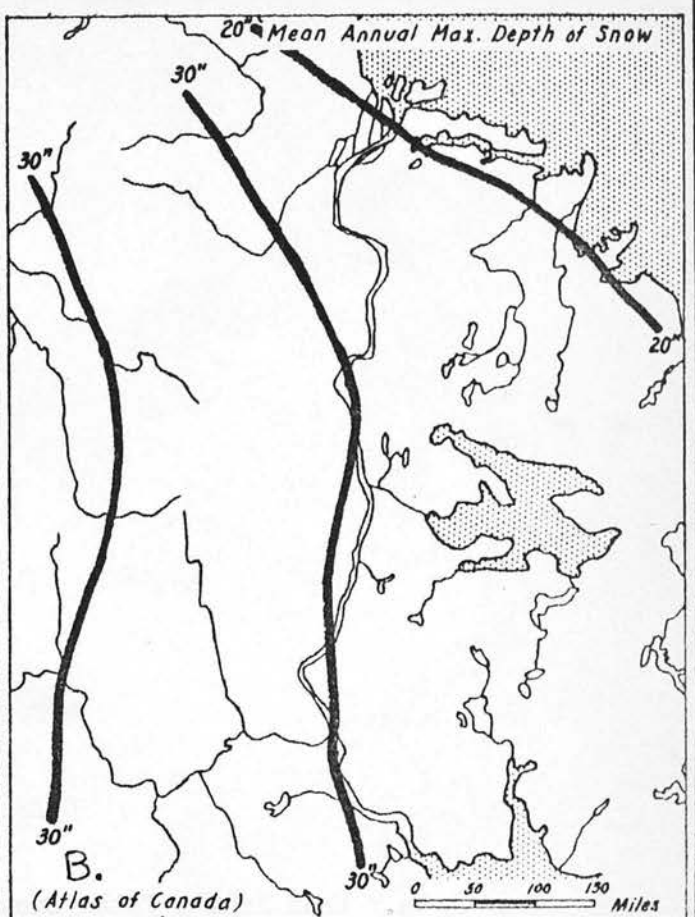
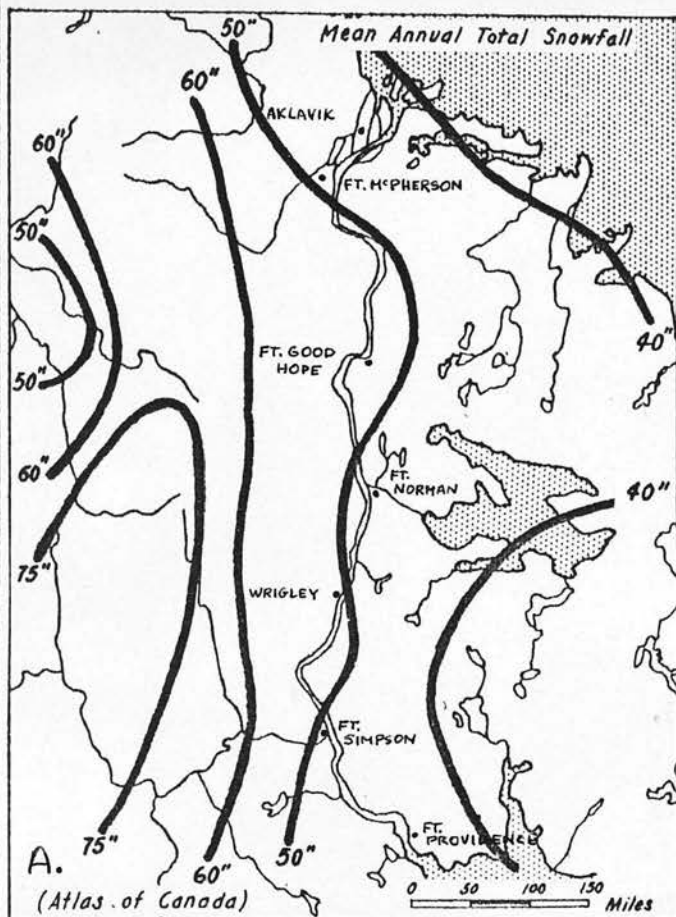
Precipitation:

The Mackenzie region has a small total amount of precipitation (Map 14A). Areas in the north receive less than 10 inches of moisture annually. The mountains of the southwest experience a higher frequency of Pacific air and also have the highest amounts of moisture. In spite of the small amount of rain and snow, it is generally held that storage of moisture over a long winter and its release during the short, cool summer, especially where permafrost reduces percolation, helps to conserve moisture and make the most efficient use of it. On balance, moisture is adequate for the forest and tundra vegetation even if not abundant. The truth lies between these two positions. Marie Sanderson has applied the Thornthwaite system to the Northwest to measure the water needs or Potential Evapotranspiration (i.e. the total amount of water needed to supply uninhibited evaporation and transpiration) (Sanderson, 1948).

Map 14C depicts the "water needs" and everywhere it can be seen that the need is never matched by the total precipitation (Map 14A). Even allowing for a slight surplus of moisture (snow) to accumulate during the winter, there is always a water deficiency in summer of about 5 inches along the Mackenzie River (Map 14D). The deficiency decreases along with the water needs towards the cooler and more humid northeast. Drought possibilities are a major consideration in any agricultural enterprise within the region and moisture availability has an influence upon the natural vegetation (Robinson, 1945, p. 40; see also section on Vegetation, p. 77).

Map 14B presents the number of days with measurable precipitation and it is a pattern basically similar to the total annual precipitation (Map 14A). People living in the southwest have to cope with more wet weather than those living on the plains of the Mackenzie region, or near the mouth of the river.

During a long winter season the Mackenzie region is snow covered for many days and snowfall is a significant proportion of the precipitation. Snow has been known to occur in every month of the year, but it is rare ~~to all months~~ in July and August in the north, or from June to September inclusive in the south. In spite of the long winter only 52 per cent of the total precipitation of Aklavik is snow. For other northern stations, Fort McPherson and Fort Good Hope the proportions are 46 and 47 per cent respectively. At the south end of the region the proportion of snowfall is even less; Wrigley precipitation is 38 per cent snow, and Fort Simpson 37 per cent snow. The reason for this pattern of snow in proportion to total precipitation is found in the fact that winter is dominated by



stable dry Arctic air. When temperatures are low, moisture content is also low. On the other hand, summer, although short, has less stable air and more storm activity which produces rain. Almost all the stations along the valley receive about 50 inches of snowfall a year; at the coast the figure is less, around 40 inches. The mountain regions are much snowier in contrast to the light snowfall on the plain. Map 15A shows the mean annual total snowfall.

Generally, at Aklavik the ground remains snowcovered after the middle or end of September. The higher land to the west is covered a week or two earlier. Gradually the winter snow-cover advances southward to reach Fort Norman by mid-October, and Providence by the end of the same month. In an average year the fall of snow accumulates to depths of about 30 inches throughout most of the valley, but near the coast, the depth of snow is less. (Map 15B). Snow depths are important to the Indian hunters whose mobility in the chase is much affected by it. Deep snow slows the movement of big game and allows the native on snowshoes to make a kill more easily. In spring, the melt of snow progresses north down the river, and there is on the average less than 1 inch of snow left at Providence by the beginning of May. In 20 more days almost all of the valley has only 1 inch or less of snow remaining. Through the delta, however, the wasting of snow progresses less rapidly, and it is nearly mid June before it is mostly gone. Alpine areas keep a snow cover much later than the valley floor, and almost anywhere at the lower end of the Mackenzie Valley it is possible to find protected snow banks persisting almost throughout the summer. The long period with snow on the ground is characteristic of the regional climate; for up to two thirds of the

year the ground is white. (Map 15C).

The amount of precipitation does not vary greatly from season to season. Summer is wetter than any other time of the year and it is only then that the stations in the valley can expect to record more than one inch in one month. More important than the seasonal regime of moisture is the characteristic variability of rainfall that is usually associated with dry regions. For example, at Fort Simpson the mean annual precipitation is 12.7 inches and in one year the highest amount measured was 17.1 inches, and another year the lowest was 7.7 inches during a 27 year period. This range between wet and dry expressed as a percentage of the mean value is a measure of the variability and at Fort Simpson is 74 per cent. Further north at Fort Good Hope the variability is 67 per cent and the two together suggest that the valley is subject to a wide range of annual rainfall. (Kendrew and Currie, 1955, p. 86). Monthly precipitation may also vary greatly. Sometimes a month may go by without even a trace, while other months have had over 6 inches at the lower end of the valley beyond Fort Good Hope. (loc. cit.) Maximum daily rainfall has been measured at four inches in the south end of the region, but never more than two and one-half inches in the north. (ibid., p. 87). Variability of rainfall on the whole is not significant for man, since it rarely is great enough to affect game. Occasionally it might aggravate forest fire conditions which destroyed hunting areas. Man himself usually avoided the worst of this hazard.

Thunderstorms occur in the Mackenzie Valley but mostly in the south where, on the average, there may be five or more summer days

with these storms (Map 15D). In the northern half of the valley, there are fewer than five days with thunderstorms, and at the coast and over the delta, there is on average only one day with thunder. No thunderstorms would be expected beyond the summer season. Hail occasionally accompanies the thunderstorm but is not common. (Kendrew and Currie, 1955, p. 89).

In winter, blizzards may occur but are not severe in the valley because of the shelter of the forest. Only in broad, open expanses can a blizzard develop strength, and blizzards are generally limited to the barren grounds or the lee side of the frozen Great Lakes. No records have been kept but a reasonable estimate of the mean annual number of blizzards at Fort Simpson is four, and Fort Good Hope is eight. Blizzards are most violent in spring and autumn. (loc. cit.)

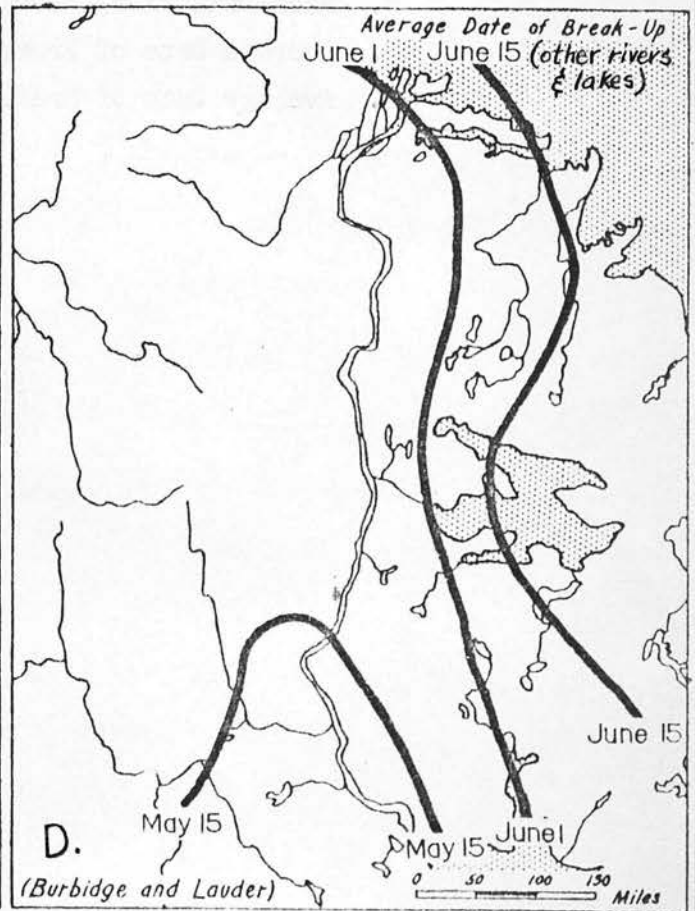
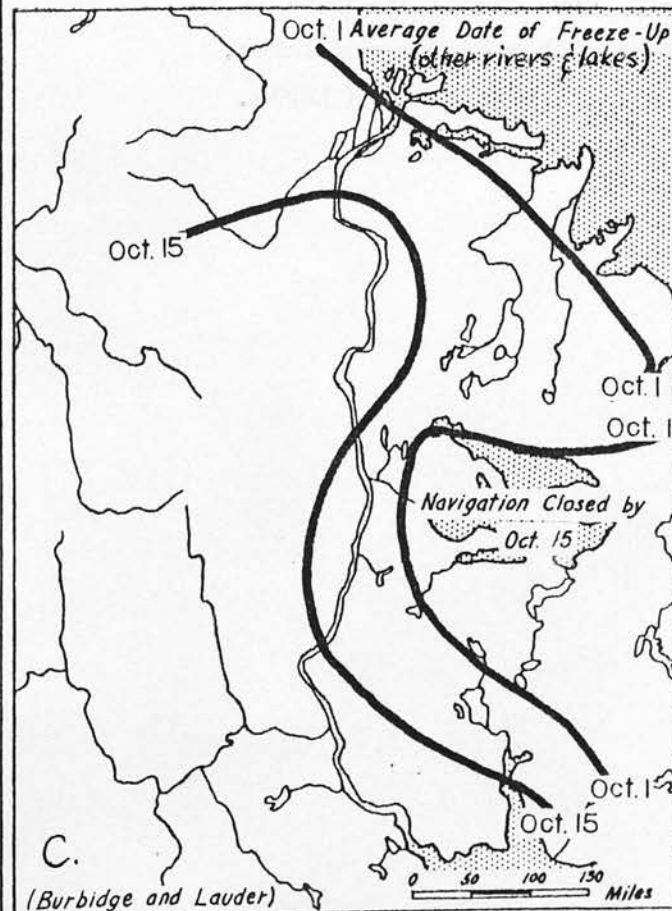
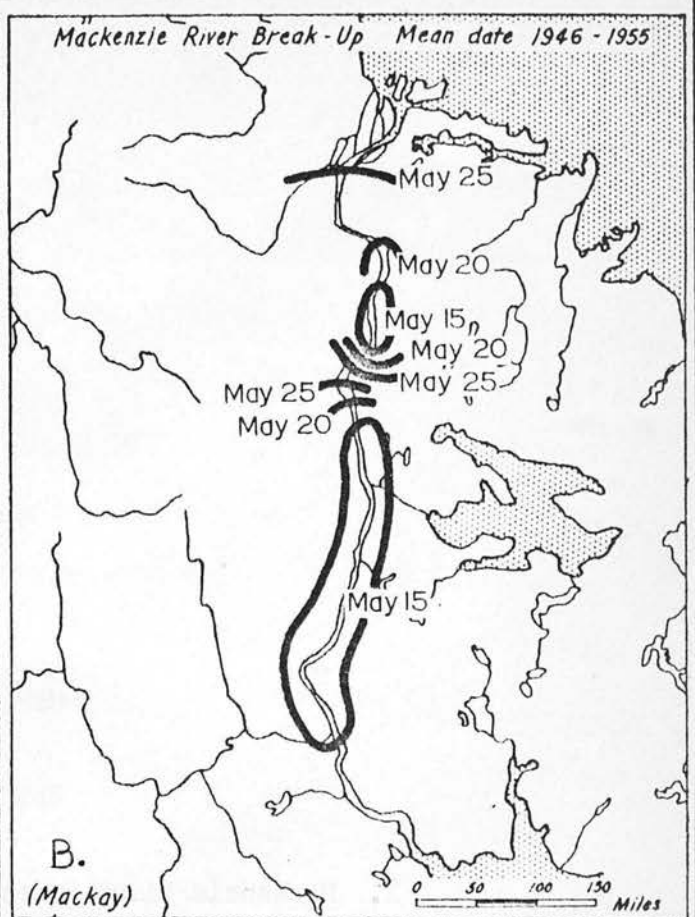
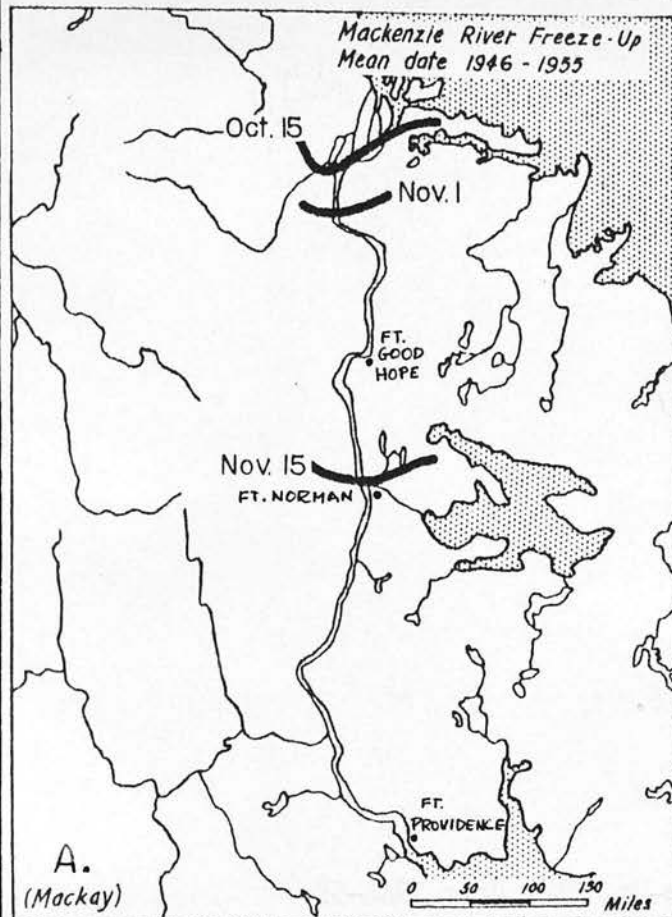
Freeze-up and Break-up in the Mackenzie Region:

The final, convincing sign that winter has arrived in the Mackenzie region is when the "Grand River" sets and remains frozen fast. Likewise, spring and summer become official after the river breaks up followed by the thawing and break-up of ice on first the small then large lakes. Freeze-up and break-up of the water bodies have great influence upon the life within the region. As yet most summer transportation is dependent upon the Mackenzie River, and winter tractor roads require frozen terrain and lakes. Aboriginal travel also took advantage of the rivers and lakes and seasonal changes were very important to native man because they severely restricted his mobility.

The long winter season with very cold temperatures produces ice of great thickness on almost all the water bodies. Some fast flowing

water, like the rapids of Great Bear River, ice does not freeze early and sometimes not at all. On the Mackenzie River recent measurements have found ice six feet thick at Fort Providence, between five and eight feet at Fort Norman and from four and one-half feet to eight feet at Fort Good Hope. (Meteorological Branch, C.I.R. 3195, ICE-4, May 1959). The ice thicknesses in the delta are between five and seven feet, and have the thickest ice development and this is particularly true for smaller bodies of water. The depth of ice is a function of the length of time the surface is frozen and small lakes tend to set earlier than larger lakes or rivers. Great Bear Lake at Port Radium (from 1952 to 1958) had ice with widely varying thickness, from four feet eight inches to eight feet two inches. Great Slave Lake at the eastern end had thicknesses of 32 inches to 48 inches (op. cit.) The thicknesses of river and lake ice in the region may well be partly a result of the light snowfall, on the reasoning that more snow early in the season may prevent deep ice development. No matter whether ice in the region tends to be four feet or six feet, it is still a thickness that would present a problem for native man who wishes to break through the ice to hunt beavers or to fish.

In spring the ice begins to melt. Lakes tend to break away around the edge helped by warm snow melt draining to the lake. The ice remains as a floating island ever shrinking until gone or dashed into pieces by wind and wave. The great lakes, Great Bear and Great Slave, are late in break-up. Great Slave Lake usually begins to break up about the last week of May and the ice will be out by the end of the second week of June (Meteorological Branch, CIR - 3156, ICE-2, 1959). Floating ice during this period may be driven to the



lee side of the lake by wind and prevent travel for short periods of time. Great Bear Lake is much later than Great Slave Lake, for at the earliest will not begin break-up much before mid-June. Generally the ice is not out of the lake until mid-July or perhaps later. (op. cit.) The navigation season on Great Bear River is temporarily interrupted in the first two weeks of July when the lake ice goes down the river. (Senate of Canada, 1888, p. 297). Map 16C depicts the progress of break-up in the region and is a generalization of the combined effect of river and lake break-up which do not occur at the same time. Thus spring may be said to have arrived at Fort Simpson by middle of May and at the delta by the first of June. The lakes to the northeast are slower to lose the ice cover and may not thaw until after mid-June.

Break-up on the Mackenzie river has been carefully examined by Mackay (1960). Rather than progressively breaking-up from the headwaters downstream, the Mackenzie ice goes at almost the same time for most of its course. (Map16B). By the 15th of May, on the average, the ice clears from Fort Simpson down almost to the Ramparts, and below the Ramparts in the vicinity of Fort Good Hope. The ice breaks up in the delta during the last week of May. A part of the river upstream from Fort Simpson may remain frozen two weeks longer than below that post. (Kindle, 1920, p. 391). The reason lies in the manner in which the ice breaks away. Snow melt and freshet in tributary streams contributes a great amount of water to the trunk stream which must rise to accommodate the flow. This breaks the ice away from the shore and sets the ice in motion when it is broken by the force of the water. The early dates of break-up compared with

the lakes are because the river ice does not necessarily have to melt before it can be carried away. (Brown, 1957). The Liard River is the largest tributary and has its headwater farther south so that break-up and flood are earlier than Mackenzie River. Thus, early in May the Liard ice goes out and the water breaks a swath across Mackenzie River ice. If ice jams occur, the water level may rise as much as 40 feet. (Mackay, 1960, p. 42). Above Fort Simpson there are no large tributaries to the Mackenzie and, therefore, ice in this portion of the river is late breaking-up. Another ice-jam may occur at the Ramparts and high water levels result. Mackay suggests that the early break-up on the mountain tributaries along the central portion of the Mackenzie accelerate the break-up of ice along the main stream (Mackay, 1960, p. 43). These great ice jams and resultant floods briefly delayed spring movement of game, hunters and trade.

With the approach of winter the process of freezing of all the waterways commences. Map 16C shows the average date of freeze-up for lakes and rivers other than the Mackenzie River. The heat loss from small lakes causes them to have an ice film formed earlier than larger water bodies. This is partly due to the wave activity which is greater on open stretches of large lakes, but mostly to the length of time that is needed to lose the residual heat of the surface water. Thus the water surfaces of northeastern part of the Mackenzie region are not on the average frozen over until the first day of October. In the rest of the area they become frozen fast by the middle of the month. The picture conveyed by the map is only general; Great Bear Lake, for instance, in recent years has not been frozen at Port

Radium until October 13th at the earliest, and November 20th at the latest. Thus, the map would seem to exclude the influence of this very large lake with so much residual heat. Great Slave Lake also begins to freeze at different times around its margin. The dates vary from as early as September 30th until as late as November 26th. To generalize, the date for freeze-up of this lake is about the last week in October. (Meteorological Branch, CIR 3156, ICE-2 1959).

Rivers freeze-up later than the small lakes because of the currents and the Mackenzie River being the largest in the region seems to have a seasonal regime of its own. Mackay (1960) shows that freeze-up progresses upstream with the delta of the Mackenzie usually frozen over by mid-October, and the ice set up as far as Arctic Red River at the end of the month (Map 16A). Heavy snowfall helps to cause freeze-up when its chilling effect may be enough to take up the last bit of the heat of fusion. (Mackay 1960, p. 26). Upstream the freeze-up reaches Fort Norman on the average by mid-November, and in the last week of that month, the river is frozen over. Thus, while the other water surfaces in the rest of the country are frozen over, the Mackenzie remains ice-free and usable by the natives later into the autumn and early in spring.

From the foregoing it can be seen that each year there are two periods of inactivity in the region insofar as travel by water or on ice is concerned. For at least three weeks each spring break-up conditions work their way northwards; in autumn during five or six weeks, ice forms in the district progressively upstream from north to south. The open season between these two times is between 160 and 180 days.

VEGETATION


As the first white men advanced northward down the Grand River, they must have noticed some changes in the vegetation. But the predominant impression remained that the banks were well wooded, and only near the Arctic Ocean itself was there a very marked variation in vegetal cover. In time, traders living along the river occasionally journeyed back from its banks and new ideas of the country developed.


Also they could see that the Mackenzie Mountains and Franklin Mountains were either partly or wholly devoid of timber. Soon botanical surveys and government investigations helped to give a better picture of the natural vegetation in the Mackenzie Valley.


Both forested and non-forested lands are represented in the region. The term "tree-line" has been used loosely to indicate the division between areas of trees and those without. It would be more effective to refer to the "polar tree-line" as meaning the most northerly limit of the tree-like species of any forested area (Hustich, 1953, p. 149-150). No trees of any sort should be encountered beyond this limit. South of the polar tree-line is a narrow transition zone which is mainly non-forested but has occasional clumps of trees and hardy individuals isolated from the continuous forest where they are protected from severe weather in hollows or river valleys. The polar tree-line closely approximates the 50°F July isotherm on the continental scale. Forest boundaries are also influenced by the availability of moisture (Hare, 1950, 1954). In Eastern Canada the boundary between closed-crown forest (boreal forest) and woodland (sub-arctic forest-tundra transition) agrees closely with an

NATURAL VEGETATION


TUNDRA


 *Stoney Sedge-Moss - Lichen*

 *Mature Sedge-Grass*

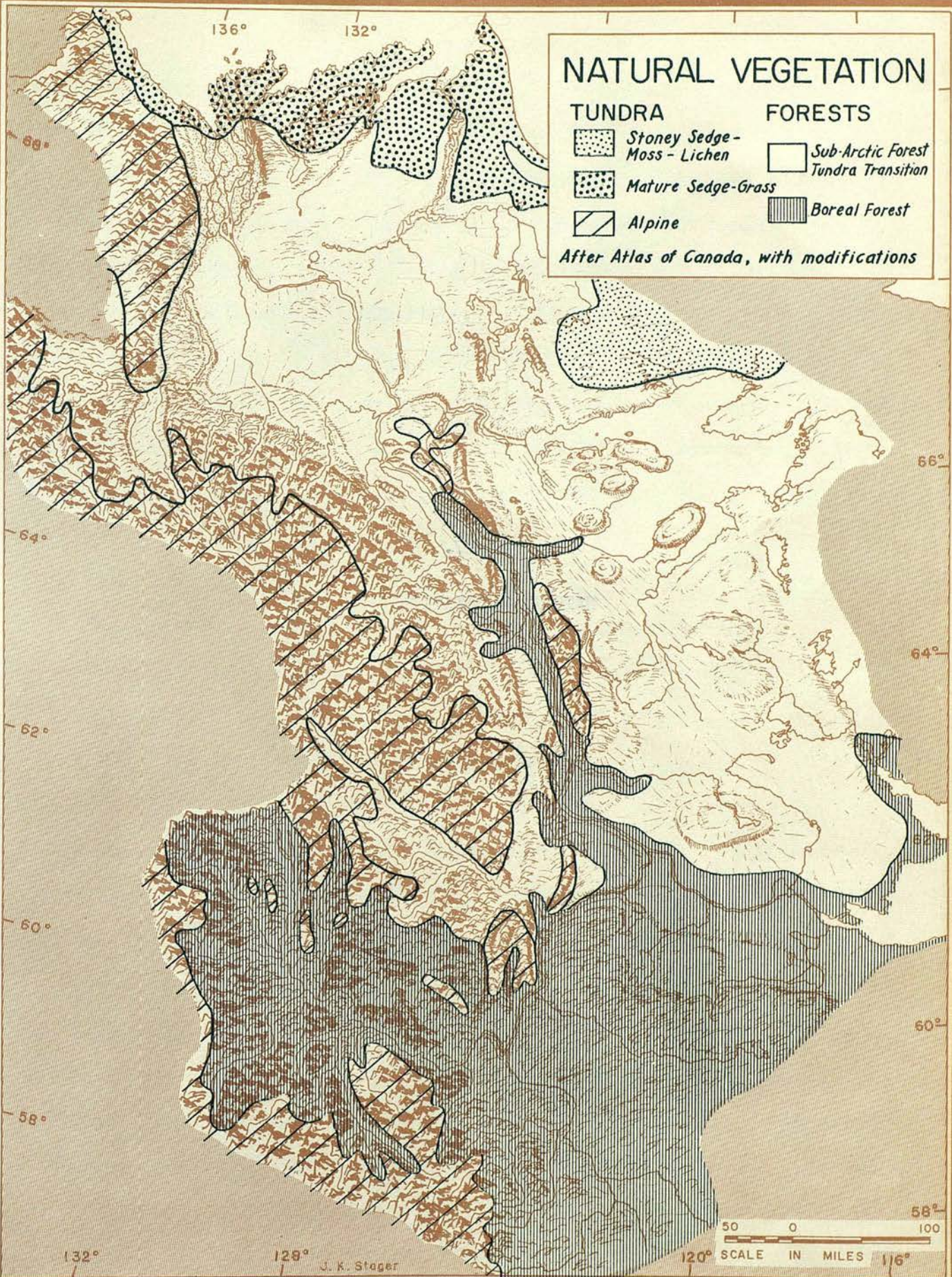
 *Alpine*

FORESTS

 *Sub-Arctic Forest Tundra Transition*

 *Boreal Forest*

After Atlas of Canada, with modifications



MAP 17.

NATURAL VEGETATION

Certain modifications have been made to accommodate the information from the ATLAS OF CANADA to this base. Also, where the topography is now better known, boundaries, particularly for Alpine Tundra, have been adjusted to the shape of the land.

isopleth along which the potential annual water need (evaporation plus transpiration) is 42 cm. (16.5 inches). Similarly the polar tree-line agrees with the 31 cm. (12.2 inches) potential annual water need. Comparison of the map showing water need (Map 14C) with the map of vegetation (Map 17) will suggest a similar correlation, although the northern penetration of trees in the Mackenzie delta is somewhat anomalous. Doubtless the forest-non-forest boundary reflects exposure to wind as well as temperature and moisture. Across the delta trees reach the latitude of $68^{\circ} 30' N.$, where they grow protected between the Richardson Mountains in the west, and Caribou Hill on the eastern side. The northern limit of trees in this location is also associated with the actively growing delta. Seasonal flooding at spring break-up and flooding of the outer delta in summer with water raised by north-westerly winds constitutes a hazard to the establishment of young trees and a consequent advance in the polar tree-line. On the upland to the east of the delta, wooded land is absent except in protected valleys. The Anderson River on the north-eastern edge of the region, is wooded downstream to a latitude of $70^{\circ} N.$, and Horton River, farther east, is forested to $69^{\circ} 30' N.$ (Mackay, 1958, p. 99). West of Mackenzie River the boundary between the forest and non-forest may be termed "alpine tree-line". This limit although one of temperature and exposure, is caused by changes in elevation and as one proceeds from a southerly to northerly latitude, the height of the alpine tree-line on mountain slopes shows some variation. On the east side of the Richardson Mountains, the slopes are scarcely forested and trees seldom form dense cover above 1500 feet. In the northern Mackenzie Mountains, however, the limit

is near 3000 feet and further south along South Nahanni River one would have to climb to 4500 feet, or sometimes 5000 feet, before reaching the alpine tree-line. At the most southerly place in the Liard drainage, trees grow up the flanks of the Rocky Mountains to about 5000 feet and in places 5500 feet. These limits, where mapped, enclose the forested part of the Mackenzie basin. A further distinction shows a difference between the Boreal Forest in the south and the Sub-Arctic Forest-Tundra Transition.

THE FORESTED LANDS

The forested lands of the Mackenzie basin are the hunting lands of the Indian people and the habitats for the fur-bearing animals that later attracted the traders. There follows a description of the character of these lands and later, some observations on the significance of the vegetation to the human activity in the region.

The Boreal Forest itself is mainly confined to the alluvial lowlands along the Mackenzie and Liard Rivers and could be described as riverine forests (Rowe, 1959, p. 27). The eastern portion of the region has been recognized as being a part of some of the best timber-producing land in the northwest. White spruce (Picea glauca) and balsam poplar (Populus balsamifera) are the main species represented along river valleys. Away from the streams, on the low benchlands and terraces on well-drained sites a growth of jack pine (Pinus banksiana) is intermixed, and on wet, low ground black spruce (Picea mariana) and tamarack (Larix laricina) often appear. An occasional broadleaf is represented in aspen (Populus tremuloides); these, however, decrease in numbers toward the north. White birch (Betula papyrifera) also is present and mixed with white spruce.

where the site is well-drained and permafrost is deep enough to permit solid rooting. In the Liard drainage another type of trees, lodgepole pine (Pinus contorta var latifolia), grows along with the usual white spruce and aspen. In other respects the Liard forests are like Mackenzie River forests with, perhaps, a tendency to be more luxuriant, and along the Liard some of the types like white spruce and balsam poplar form pure stands. In this area, also, the limit of trees is controlled by elevation. Alpine fir (Abies lasiocarpa) grows near the alpine tree-line.

Beyond the region of favoured growth where the Boreal Forest exists, is the type of forest cover which result from less favorable climatic and edaphic conditions. Here is essentially the transition zone between forest and tundra vegetation, where patches of both are represented within the area, and it is properly denoted as Sub-Arctic Forest-Tundra Transition. This transition is not as easily recognized in some portions of the valley as in others. For example, along Mackenzie River itself, downstream from Norman Wells, the trees are noticeably smaller in size and there is a change in composition of the forest. The dominant environmental feature here is permafrost. The active layer above permafrost varies in depth, being deeper on well-drained, loose-textured soils, and very shallow under organic soil. If the permafrost table is not high or is absent, good stands of white spruce reach saw-log size, but on the fine-textured alluvium it is more usual to find stunted black spruce in a mixture of willows and alders. Aspen and Balsam poplar occur where the active layer is relatively deep on upland sites (Stoeckeler, 1952, p. 14). Occasional thickets of "paper" birch tend to grow on

similar ground, although towards the north they are small. From the Mackenzie River the forest looks remarkably dense but in general through the region there is far more non-forested than forested land. Twenty to thirty miles back from the river to the northeast, anywhere along its course, the forest is truly the transition type. It is open sub-arctic woodland that represents the adaptation of trees to unfavourable climatic conditions, generally thin soils, permafrost, and frequent fires in the past. Trees are mostly black spruce and occasionally white spruce. White birch is present in the south, with tamarack towards the north. There are also some stunted aspens and balsam poplar. In fact, most of the stands are dwarfed and they are intermixed with areas of bog and muskeg on the Mackenzie lowlands, and considerable areas of bare rock are exposed on the shield country at the eastern margins of the region. Along the polar tree-line in the Anderson River area and south of the Eskimo Lakes the open woodland becomes confined to protective valleys, and in them trees grow quite far north. White spruce and black spruce are usually the hardy varieties, although they are small and widely spaced (5 - 10 feet high, 2 - 5 inches in diameter and 25 - 50 feet apart). (Mackay, 1958, p. 101). Ground birch, willow and alder bushes are common in these locations. Balsam poplar and tamarack are represented as far north as the delta. Here they intermix with broadleaf varieties which occur on the high levees of the Mackenzie distributaries. White spruce growing on the Mackenzie delta above latitude 67°N include trees that are more than 500 years of age, and so it would seem that the polar tree-line has been stable for at

least five centuries (Giddings, 1947, p. 26).

West of the Mackenzie the transition from forest to Alpine Tundra is based upon altitudinal change analogous to the latitudinal transition on the other side of the river. The open stands dwindle as patches of grassy or shrubby vegetation and bare rock become increasingly dominant upslope. Alpine fir is part of this alpine transition on the Liard and Yukon sides. It is not common on the Mackenzie side. (Porsild, 1941, p. 14). White spruce is also found high up but black spruce, broadleaves, and tamarack are left at lower elevations.

THE TUNDRA LANDS

"Tundra" is from a Finnish word meaning treeless rolling plain. (Porsild, 1951, p. 130). Specifically it has come to mean regions which have a closed or continuous cover of vegetation (no trees) and a protective snow cover in winter (*ibid.*, p. 16). The Tundra is distinct from rock barrens as represented by many areas in the Queen Elizabeth Islands. It supports a quite different animal population, not originally attractive to the trader or the Indians of the forest. Living along its edges were Eskimos who for some time remained remote from the activities along the Mackenzie River. The significance of the Tundra is later considered.

Along the north slopes of the Richardson Mountains extending to the coast is Mature Sedge-Grass Tundra. This region is continuous to the east across the outer edge of Mackenzie delta, Richards Island and the whole length of the Tuk peninsula. The area south of the Eskimo Lakes east to Anderson River and beyond exhibits this same general type of vegetal cover. Permafrost underlies the entire

region and often massive ice bodies are not far from the surface. Thus the ground is usually wet from impeded drainage during the short growing season. Where there is semblance of good drainage on protected slopes willow thickets (Salix arbusculoides, S. Richardsonii, - for example) form the cover and occasionally alder (Alnus crispa) is present. These bushes grow up as high as five or six feet near the south end of Eskimo Lakes. Other low bushy plants like ground birch (Betula glandulosa), Labrador tea (Ledum decumbens) and Lapland rhododendron (Rhododendron lapponicum) form continuous cover on more open sites. In other locations, especially level ground, drainage is poor and wet areas are usually marked by sedge and grass associations. Cotton grass (Eriophorum vaginatum and E. spissum) is one of the common kinds and it tends to form tussocks in company with sedges. Tussocks are ball-like creations composed of living and dead plant matter that grow up to about one foot high. They develop an association with frost heaving of mineral soil and occur quite close together often surrounded by standing water. (Hopkins and Sigafos, 1951, pp. 70-92). Walking over these "tetes de femmes" is exceedingly wearisome and hazardous unless properly shod. Close to the polar tree-line this tundra vegetation cover is unbroken, but nearer the coast, especially to the east on the Tuk Peninsula and on Cape Bathurst, increasing amounts of bare mineral soil are exposed. At this latter location Mackay estimates the bare ground to be 20 to 30 per cent of the surface (Mackay, 1958, p. 104). Exposures of mineral soil may be associated with forms of patterned ground common in the region, for frost-boil-like action will expose circles or polygons of soil that develop into long stripes on sloping ground. These bare patches are not easily recolonized by tundra plants (loc.cit.)

Further east, out of this region, is a Stoney-Sedge-Moss-Lichen Tundra, and some of this association occurs north of Great Bear Lake. Mosses and lichens are by no means absent from the mature tundra communities; in places that are liable to dry out during the summer one can find representatives of the so-called reindeer mosses (Cladonia rangiferina, C. alpestris) that assume a yellow to grey hue and are so extensive that at times the ground may appear to be snow covered.

ALPINE TUNDRA

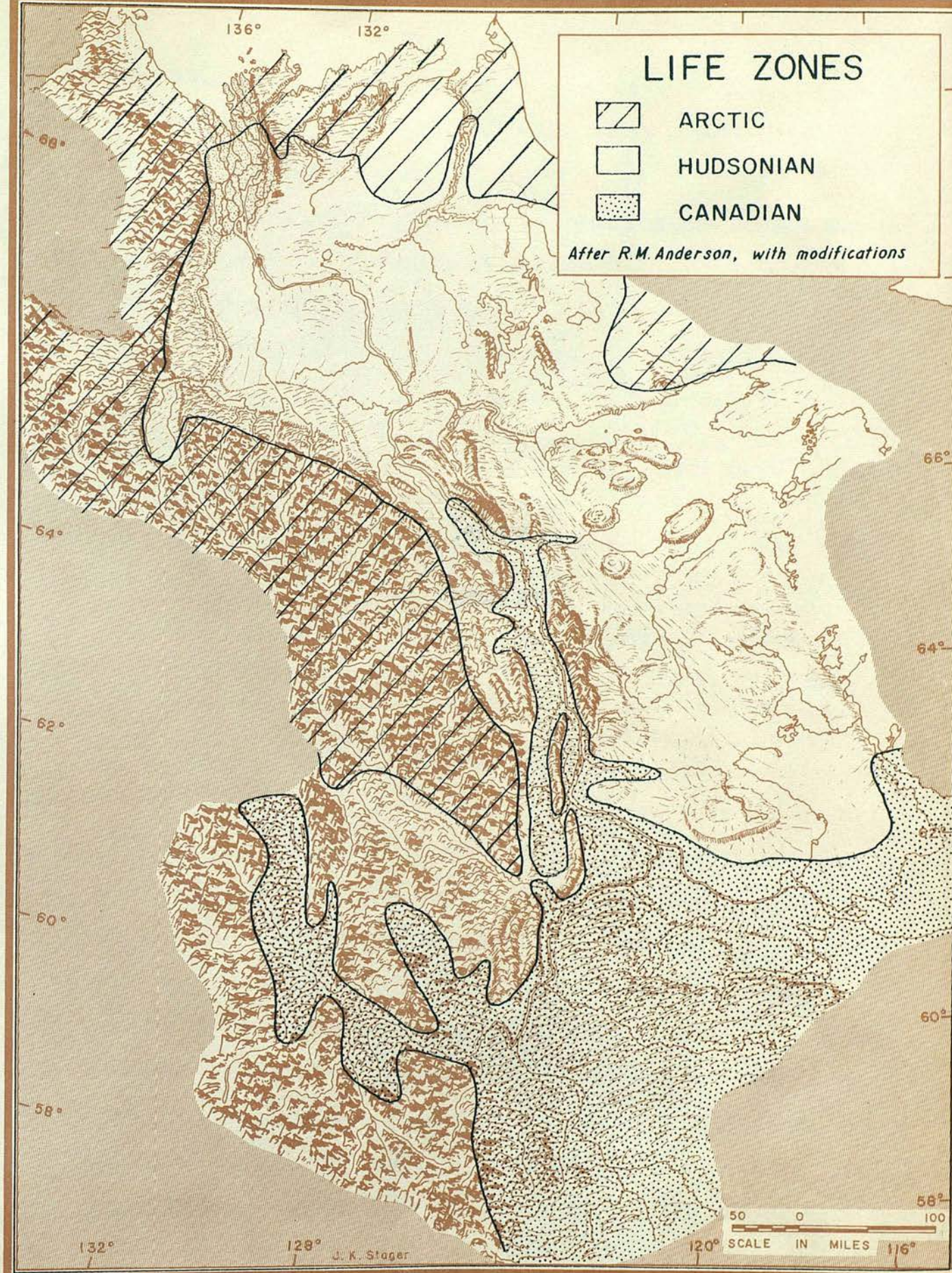
Great variety in the amount of vegetal cover is usually experienced above alpine tree-line. Everywhere the land surfaces shows different slopes from flat uplands to steep, active talus. Also a variety of rock types have weathered differently so that one locality may be a barren exposure of bald, resistant rock, where another surface may be thickly covered with weathered debris. Equally important as the varying ground conditions are local variations in the climate - particularly the aspect related to sunshine, snow accumulation, and local funnelling of winds. Vegetation types and their distribution are difficult to generalize under these conditions. Where slopes and climate permit, alpine meadows not unlike the mature tundra of the coast can be seen. Usually in mountain areas most of the surface is in sloping ground and mass wastage keeps it bare or nearly so, and a high proportion of the area shown on the map as Alpine Tundra is bare ground. The common tundra plants, however are represented in both Alpine and Mature Tundra.

Importance of Vegetation

Native man, and later white man made certain obvious uses of the vegetation throughout the valley. Trees particularly were utilized for fuel, shelter, weapons and the like. The trading posts consumed a great deal of wood for winter fuel, and one of the prime considerations in siting a post was the availability of firewood. Since the buildings and even furniture were usually made from local sources, good stands of construction timber were also a great asset. In time, the local wood was cut down around the forts and men were forced farther and farther from their base in an attempt to satisfy the continuing demand for it. Other smaller plants provided food. Most of these are wild berries like blueberry, gooseberry, raspberry, wild currants which are found mainly along the Mackenzie River (Albright, 1937, p. 77). Towards the colder climatic regions bearberry, cranberry, salmonberry or baked-apple and bogbilberry are used by the natives (Porsild, 1951, p. 140). On the tundra away from the coast, natives used some plants like dwarf willow and Arctic heather for fuel - the latter has a particularly resinous character and will burn when green. Dried reindeer moss also furnishes fuel. Besides these plants which are valuable in the maintenance of life, there are many beautiful flowering varieties. They are especially noticeable on the mature tundra and on the alpine tundra, although flowers occur in the woods as well.

FAUNA

All the elements of nature as they occur in the Mackenzie region have influenced in greater or lesser measure man's adjustments to his environment. None, however, has affected his daily living more



MAP 18.

LIFE ZONES

The map by R. M. Anderson (1946) from which this data came was made before the latest information on topography and vegetation was available. Accordingly, the boundaries of the Life Zones have been slightly altered, especially in the mountainous areas, to show where plain-dwelling and mountain-dwelling mammals actually occur.

than the faunal world. Indeed, man is part of this world and his existence may be told as a story of conflict or harmony with other members of the animal kingdom.

The original supreme animal was and remains the native Indian and Eskimo described by Anderson as follows:

"Homo sapiens americanus Linnaeus
Type locality. Eastern North America
Range. The native races of Homo sapiens. Formerly widely distributed in Canada where living was possible under primitive conditions, but with many local variants, cultures and tribes. Now gone from many parts of former range, reduced in number in other districts, but progressing in other sections."
(Anderson, 1946, p. 34).

He occupied all of Mackenzie River drainage and ranged over all the Life Zones in the region. However, his description will be reserved for a later chapter on native occupance. In the meantime, attention is concentrated on the life on which man so very much depended.

The Life Zones (Map 18) represent environments within which animal life is of a type, and best suited to cope with its daily needs of food and the seasonal compulsions of procreation; they are not unlike the Vegetation Zones. The Arctic Life Zone is a region where animals live on the tundra adjusting to its particular hazards. The Hudsonian Life Zone corresponds to the Sub-Arctic Woodland-Tundra Transition in vegetation, and in part, it is a region of transition in animal life. Certain "barren ground" beasts meet their woodland counterparts in this zone. It also represents the northern limits of forest dwelling animals. In the southern part of the region is the Canadian Life Zone coincident with the Boreal

Forest vegetation and embraces the upper Mackenzie and Liard drainage areas. These life zones have more validity for land-bound animals than those which fly like birds and insects, or those which can migrate along the courses of the rivers like fishes. Principally, therefore, the life zones are valid for the distribution of mammals.

MAMMALS

The most significant boundary on the map of Life Zones is the one which divides Arctic from Hudsonian - tundra from trees. Mammal life even up to the highest representative in man is different on either side of this line, with Eskimos living on the so-called "barren ground" and Indians as the forest dwellers.

ARCTIC LIFE ZONE

Animals important primarily for food and skins:

Mammalian life in the Arctic Zone is distinctive in that sea mammals are present along the north coast, and are the basis of life for some of the Eskimos frequenting these regions. The most significant of these is the White Whale (Delphinapteris leucas Pallas) that is found all along the coast between the Alaska boundary and Cape Bathurst. At certain seasons it is abundant on both sides of the mouth of the Mackenzie River. The overall range of this animal is circumpolar, but in Canadian Western Arctic it occurs from the Yukon River mouth east to Coronation Gulf. (ibid., p. 86-87). Their migrations are controlled by feeding habits and sources of food, and they appear off the mouth of Mackenzie River in July and remain sometimes into August to feed on the fresh water fishes that reach the brackish sea. (Anderson, 1951, p. 500). Near the end of this season ^Wwhite ^Wwhales can be observed moving westward,

so that it appears that they migrate from the east to west as the sea ice breaks up during the summer. The animal itself is white as its name suggests and at maturity is from 12 to 16 feet long. It is a fast swimmer and can make speed up to 6 miles per hour and so challenges the skills of the native in his kayak during the chase. (Kellogg, 1940, p. 72).

A much larger (50-65 feet) sea mammal is the Bowhead Whale (Balaena mysticetus Linnaeus) which enters the Beaufort Sea from the west, migrates eastward and then returns in a single open season. These animals were once the prized object of Eskimos hunting from various stations along the coast, particularly west of the Mackenzie delta. White hunters sought them as well, and once they learned that the Bowhead inhabited the Arctic Ocean, whalers followed it there just before the turn of the century. A number of circumstances contrived to end this whaling period about 25 years after it had begun, but not before the Bowhead was much reduced in numbers and the presence of whalers had made a profound impression on the fortunes of the Eskimos in the Mackenzie region. The animal is making a comeback in numbers now that the whalers are gone. (Anderson, 1937, p. 100). The attraction of this beast for the Eskimos was, of course, the vast amounts of meat it provided, and the large quantity of oil for fuel which could be secured.

Another important mammal, the Ringed Seal (Phoca hispida Schreber), is common throughout the Arctic Ocean. An adult weighs between 125 and 175 pounds, although larger beasts have been taken (Anderson, 1951, p. 526). Seals, hunted all the year around, were in the past, and to a certain extent remain, a staple ingredient of

the diet of some Eskimos. The hide is also valuable for clothing. A second variety of seal, the Bearded Seal (Erignathus barbatus Erxleben) frequents the shore regions of the coast, but stays away from the delta area because it cannot see very well in the muddy water. It is generally less common west of Darnley Bay (Anderson, 1937, p. 102). The animal is prized by Eskimos for its hide which is thick and tough, and is used mainly for foot gear and thongs. There are other types of seals that have been reported along the Mackenzie Coast, but they appear to be accidental occurrences rather than frequent visitors. Probably in the time before the white man and even before his influence crept eastward from Russian trade, another common sea mammal was the Pacific Walrus (Odobenus obesus, Illiger). At present it is rarely seen, although reports of the animal have come from Herschel Island and Anderson River (Anderson, 1951, p. 526). The occurrence is certainly only casual.

One mammal of importance to native man that spends much of its life "at sea" is the Polar Bear (Thalarctos maritimus, Phipps). Polar bears exist almost completely on the sea ice and only during the winter when the ice cover extends to the shore do they come within range of the natives of the Mackenzie coast. Even then they are not frequent visitors between Herschel Island and Cape Dalhousie, but are more numerous around Cape Bathurst. Such large animals, for the large ones are nearly half a ton, are pursued by the natives whenever they encounter one, but Eskimos in the Mackenzie region do not have organized polar bear hunts. Polar bears do not hibernate and because they are near land in winter during the dark period, they may stumble unwittingly into an Eskimo camp and be an alarming

intruder. If killed, the natives prize the skin and meat; the liver is said to be poisonous.

The landward side of the Arctic Life Zone has a surprising variety of mammals all of which are valuable to man either directly or through nature's food chains. The largest and most fearsome beast is the Barren Ground Grizzly Bear (Ursus richardsoni, Swainson) that frequents the region east of the Mackenzie River and is plentiful near the Anderson River and beyond it to the east. Coincident with the range of the Barren Ground Grizzly are the habitats of other bears - Macfarlane's Yellow Bear, Anderson's Grizzly and Macfarlane's Grizzly. All these bears possess similar coloration, from light tan in late summer to a dark brown, and are smaller than the Barren Ground Grizzly Bear. Some of them range into the delta, which the Barren Ground Grizzly does not do. In the delta itself and on both sides of it, especially the western side, is a bear known as the Mackenzie Delta Grizzly (Ursus russelli, Merriam). It may be thought of as the transitional sub-species from the east side of the river to the west where the Alaska Boundary Grizzly, another barren ground bear lives. In the Richardson Mountains and south into the Mackenzie Mountains, other bears of a similar type occur like the Big-Toothed Grizzly and Pallas' Grizzly. All these bears are slightly different in structure and size, but their habits are much the same whether they live on the coastal tundra or in alpine tundra. They pass the winter hibernating in caves or burrows and emerge when the snow starts to disappear. At this season of the year they become quite hungry as a result of the winter hibernation and also because their usual

vegetative diet of roots, berries, grasses, etc., are not yet available. They subsist in the spring by catching whatever insects or small mammals they are able. Such habits do not constitute a menace to man and consequently the Barren Ground Bears are not often killed. Besides when wounded these animals have notorious reputations for bravery and cunning. Eskimos and Indians alike, even with modern weapons, hold the Barren Ground Grizzly Bear in high respect.

The most important land animal to man living in the Arctic Life Zone is the Barren Ground Caribou (Rangifer arcticus Richardson). Before "civilizing influences" reached the Mackenzie region there were plenty of these animals. The coastal plain west of the delta supported large herds, which, due to overhunting, have nearly vanished from the coastal area and have retreated south to the relative protection of the mountains. East of the delta, on the sides of the Eskimo Lakes, large herds used to roam but these have now shrunk in size and withdrawn from the coast to the area north of Great Bear Lake. The animal has wide geographic distribution on the tundra, and local variations, in colour particularly, have been observed. Caribou seem to have been least common near the delta. The importance of the animal is summed up by R.M. Anderson when he states "There is scarcely anything manufactured which can equal Caribou skin as an article of clothing; in many districts the natives live for long periods almost exclusively upon the meat of the Caribou, while there are many vast sections of land which could with difficulty even be explored without relying upon finding the herds of Caribou". (Anderson, 1951, p. 502). Caribou migrate with the seasons, moving

north in the summer to graze over the mature tundra ranges. Farther to the east they trek to Victoria Island across the ice at the beginning of May. Near the delta they range north to graze the Eskimo Lakes area. In winter, these animals retire towards the tree-line and take refuge in the scattered clumps of trees. The light snowfall in the western Arctic and strong winds help to keep patches of *Cladonia* moss free for the caribou to feed upon, and large groups of them winter around Great Bear Lake and Great Slave Lake (Banfield, 1951, p. 120). Caribou bulls shed their horns in January and young bulls and cows drop antlers in May. By this time the old bulls have begun to regrow antlers, and by these seasonal changes the natives are able to tell sexes and pick the best beasts to kill, in terms of their general condition. Fawns are dropped during the first two weeks of June and usually arrive singly; at this date the animals are already at the summer feeding grounds. On the west side of Mackenzie delta is a considerably larger subspecies of caribou that ranges the tundra particularly on the lower slopes of the Richardson and British mountains. In recent years the number of caribou west of the delta has fluctuated somewhat, but they never have been plentiful since the turn of the century.

In the Arctic Life Zone are the Northern Mountain Sheep (Ovis dalli, Nelson) which live in the mountains west of the Mackenzie River from opposite Fort Norman north to the delta and beyond. It is likely that they were rarely hunted by the Eskimos because the sheep prefer relative isolation high up in the heads of valleys which lead down to the coast. Indians, on the other hand, may well have hunted them, and this may explain their relative abundance towards

the north end rather than the southern end of the Alpine tundra region. No doubt sheep were numerous until the demands of whalers decimated the caribou population and forced the Eskimos to hunt sheep. (Anderson 1951, p. 508). The animal lives in difficult terrain, apparently remaining there in all seasons, although they have been seen in wooded country rarely. Lambs are born earlier than caribou fawns while snow is yet around. In summer sheep migrate to the fringes of ice fields or snow patches to escape the torment of mosquito and flies. Since the coming of white men the Northern Mountain Sheep has been hunted more often as an object of big game activity rather than any useful reason.

Some Musk Oxen (Ovibos moschatus moschatus, Zimmermann) are found in the Arctic Life Zone to the east of Mackenzie River. They are not numerous because they are easy prey for man, and so restrict their range to more remote territory. Before and during the early part of this century they occupied the barrens north of Great Bear Lake, but recently have been sighted further east and south of that lake. (Banfield, 1951, p. 121; Anderson 1951, pp. 506-7).

Animals important primarily for their pelts

The Gray Wolf of the barren grounds (Canis lupus, Linnaeus) may be found everywhere the caribou ranges. In groups of up to five or six individuals, these animals pursue caribou herds and live by running down stragglers, be they fawns or old animals. The wolves will eat other smaller mammals when they find them, but these do not constitute their main food. Eskimos prize the fur of this animal, especially the long fur on the nape of the neck. These bits of fur

form the highly fashionable trimming about the hoods of their parkas.

A smaller carnivore is present on the tundra in the form of the Arctic Fox (Alopex lagopus innuitus, Merriam). He is as much a scavenger as he is a hunter, and in winter will wander out on the sea ice following the trail of polar bears in hope that some residue from a bear's kill awaits him. When the fox is unable to scavenge, and this is generally so around the Mackenzie mouth, it preys upon lemmings, field mice and moles all the year around, but may, in summer, attack the nests of birds which are either on the ground or on the margin of the many lakes and ponds. Eskimos frequently eat white foxes and would catch them any time during the year before they learned that the fur was valuable as an article of trade. Now they are taken only from December to March when the skin is "prime". (Anderson, 1951, p. 517). A colour phase of the White Fox known as the Blue Fox occurs but is not common. The fur colour is a grayish to bluish tone and is not often a uniform shade over the whole animal. Foxes themselves are preyed upon by hawks and falcons. The Rough-legged Hawk is the chief menace.

Ermine skins have been used by the Eskimos both for trimming and decoration of their clothing, and as a charm against illness or for luck while hunting (*ibid.*, p. 523). The animal which they catch is the Western Arctic Weasel or Tundra Weasel (Mustela erminea arctica Merriam), which ranges the tundra region, including alpine tundra, but in the vicinity of the Mackenzie River is not particularly numerous. The weasel is entirely a carnivore, preying upon other small animals, insects and the like. In winter it changes its

colour to a protective white with a black tail-tip.

During summer hunting excursions the Eskimos catch and eat the "Tsik Tsik" or Mackenzie Ground Squirrel (Citellus parryii vennicotti, Ross). Women and children sit with snares about the holes of the dens and catch them about the head when they re-appear. The skins are used for light clothing, or when other furs are scarce (Anderson, 1937, p. 109; also 1951, p. 520). A slightly different and larger ground squirrel is found in the Mackenzie Mountains.

Other Mammals

The Arctic Life Zone has other mammals which are not directly sought by man, except perhaps on occasion. It is sufficient to list these beasts as including lemmings, mice, voles, shrews, and the occasional hare.

HUDSONIAN LIFE ZONE

Animals primarily important for food and skins:

Bears from the Arctic Life Zone invade the forested regions especially on the fringes of their own habitat. They have been observed in the Mackenzie delta in the spring rooting about for food in the form of muskrats or fish, etc. (Porsild, 1945, p. 8). Black bears (Ursus americanus americanus Pallas) on the other hand, properly belong to the Canadian Life Zone of the dense boreal forest. They do, however, invade the southern margins of the Hudsonian Zone and locally have been taken throughout the latter area. These animals, like the barren ground variety hibernate during the winter and are to be seen when warmer weather and melting snow indicates the advance of summer. The flesh of bear is a great delicacy to the natives, and the skins were useful for clothing and shelter, although

now they are traded or sold to tourists. (loc. cit.)

A large animal and much sought for its flesh and hide is the Moose (Alces americana, Clinton). It is a woodland animal ranging from the Canadian Life Zone through the Hudsonian to the open tundra. It has been taken on the barrens but usually does not venture there. Moose were plentiful in the Mackenzie delta, but there are now not as many, probably due to more effective hunting implements and wider ranging hunters, (ibid., p. 20). The hide is generally still used for moccasins, but is not often used for clothing because it is too thick and porous. (Anderson, 1937, p. 102). There is some indication they are becoming common south of the Eskimo lakes. (Banfield 1951, p. 119). In any case, the animal used to be the staple for some Indian tribes along the Mackenzie River.

In the light woods northwest of Great Slave Lake, caribou were observed in 1949 (ibid., p. 120). These were presumed to be the Western Woodland Caribou (Rangifer caribou sylvestris, Richardson), which are found throughout the Hudsonian Zone from Hudson Bay north to Anderson River. (Anderson, 1937, p. 103). The Indians were always anxious to capture these animals, not only for their flesh but especially for skins with which to fashion winter clothing. This subspecies of caribou is not thought to be represented west of the Mackenzie River where a larger mountain caribou is present. (loc.cit.)

Rabbit populations which have fluctuated widely along the Mackenzie River, formed the staple animal resource for one tribe of Indians in particular, namely, the Hare Indians. The rabbits are known as either the Snowshoe Rabbit or Mackenzie Varying Hare (Lepus americanus macfarlani Merriam), and occur in forested zones through-out

the valley but are mainly concentrated in the Hudsonian Zone. The rabbit diet is bark and buds of deciduous trees particularly alder, willow and ground birch. In winters with deep snow, they have difficulty in surviving when tender tips of shrubs are buried, and they must forage under the snow. The violent fluctuation in numbers do not seem to be linked to disease; possibly the gathering strength in numbers of predators - man, lynxes, foxes, weasels, wolves and owls - combined with unfavourable snow conditions could offer an explanation. In any case, the flesh is never considered to be choice because it lacks fat, although the skins were much used for clothing.

Muskrats frequent the lakes and ponds which are deep enough to prevent freezing to the bottom in mid-winter. They are especially common in the Mackenzie delta where the maze of lakes and channels provide ideal habitation. These animals are known as the Northwest Muskrat (Odondatra zibethica spatulata, Osgood) and they feed on roots and stems of water plants, living in burrows in the banks of the stream or in vegetation piles pushed up into houses, not unlike the beaver. Sometimes "rats" are hunted by destroying their huts, but usually they can be secured more easily when spring comes, flood waters fill the delta lakes and the animals are swimming around in pursuit of food. Both Indians and Eskimos welcome the flesh for food, and the skins were once used exclusively for clothing, although now are a valuable article for trade. These animals sometimes raise two litters in a season, each litter being made up of about 6 individuals.

In all the small rivers and streams, ponds and small lakes the Indians could find the Beaver (Castor canadensis canadensis Kuhl).

This energetic rodent whose habits of hard work and prudence are well known to every Canadian, was first the symbol of the fur trade and later taken as the national animal emblem for the country. It is a large animal with the adults of about 50 to 60 pounds, but some have been found up to 100 pounds. Its fur was especially desirable for the fabrication of felt, and ultimately this led to the extensive fur trade which, above all, was responsible for the exploration of the northern half of North America. Indians, when they were able to catch the beast, found it a very acceptable food, and used the fur for clothing. With the coming of the fur-trade, beaver was not often used as clothing but became a profitable item of trade. The habitat of the beaver coincides with the forested lands, i.e. both Hudsonian and Canadian zonal ranges. It has been found north to the trees in the Mackenzie delta and occasionally beyond the trees in streams draining to the delta. (Porsild, 1945, p. 15). The beaver is now protected to ensure its healthy survival.

Animals important primarily for their pelts

Wolves frequent the Hudsonian Zone as well as the Arctic Life Zone, and although known by different names, the animal is still Canis lupus. There is a great variability in colouration and other characteristics of the animal, and it ranges so widely, being adaptable to most northern environments, that a distinction of wolves on a geographic basis is difficult. Thus the Arctic Wolf, Gray Wolf, Timber Wolf, Tundra Wolf and Northern Wolf can be regarded as one and the same. The beasts live by preying upon the ungulates - Mountain sheep, caribou, moose, deer, etc., and they will kill ground squirrels, rabbits, ptarmigan and other small animals. Wolf hides

were used for clothing by the Indians, although now they are traded.

Much like the wolf, but smaller in size, is another dog-like carnivore, the Coyote (Canis latrans, Say) which perhaps at one time was not common in the Mackenzie drainage, but now appears to be making the Hudsonian zone its territory, especially west of the Mackenzie River. (Anderson, 1937, p. 107). It now is found northward to head of Mackenzie delta (Porsild, 1945, p. 12). If the animal were not common in the middle Mackenzie area, then it could not have been important in the life of the Indians of that region. However, coyotes were known to the natives of the upper Mackenzie at least within the Canadian Life Zones and especially where open prairie-like patches of territory existed. Once again, the hide was the main incentive for catching the beast.

Red foxes (Vulpes fulva alascensis, Merriam) are not always red in colour, but occur in a variety of colour combinations from red to yellow to black or silver. Those which are all red in colour go by the proper name, Red Fox, and those few which are black are known as the Black or Silver Fox. All other combinations are generally known as Cross Foxes. These animals inhabit the whole of the Mackenzie valley down north from Great Slave Lake and their hides now are valuable as items of trade. A red fox is the true "Reynard" of legend, and is a very wary beast. It is hard to trap and old individuals become exceedingly cunning (ibid., p. 11). Foxes live in dens, in dry, sandy soils, and raise broods of up to seven in number. Their food includes birds, small mammals, and sometimes fruit and insects. (Cowan and Guiget, 1960, p. 286).

The Canada Lynx (Lynx canadensis canadensis, Kerr), is an

important fur bearing animal that inhabits the forested lands. It exists almost exclusively on killing rabbits, and the abundance of lynxes seems directly proportional to the rabbit population. When the periodic disappearance of rabbits takes place, every nine or ten years, the lynx will extend its range greatly in search for food (Anderson, 1937, p. 108). It was relatively easy for the Indians to snare this beast and it was sought for both flesh and fur.

In the north country, the greatest source of annoyance to man excepting mosquitos is the Wolverine (Gulo luscus Linnaeus). Wolverines are found throughout the wooded lands and even on the barrens in summer. They form a short-legged, sturdy beast with a short bushy tail, and resemble an overweight weasel, weighing up to 30 lbs. (Cowan and Guiget 1960, p. 321). They live by killing small mammals and birds, and energetically rob traps once they find a trap-line. Wolverines will invade food caches and great precautions must be taken to protect stored food from these beasts. The fur, especially the lighter coloured part from its flanks, is prized for the trim of parka hoods because frost does not adhere readily to the guard hairs (ibid., p. 107).

Several fur-bearers of the weasel family live in the Hudsonian Life Zone, and the largest is the Mackenzie Otter (Lutra canadensis preblei Goldman). It is an aquatic mammal that is not especially common in the northern part of the range. The Marten (Martes americana arctuosa Osgood), on the other hand, is land-oriented and lives from hunting small mammals and birds. It too is not as numerous near the northern margins of the Hudsonian Zone, and is

found generally throughout the forested areas (ibid., p. 106). In the northern part of the Mackenzie valley Alaska Mink (Mustela vison igens Osgood) live by small rivers and creeks feeding on fish or muskrats (Porsild, 1945, p. 11). Ermine, or weasels in several subspecies occur in the Hudsonian Zone and are sought only for their skins.

The Hudsonian Life Zone is a transition for some of the smaller mammals that play no direct part in man's activities. For instance, mice and voles range from the Arctic to the Boreal forest and an occasional lemming appears in the forested fringe near the tundra. Ground squirrels, too, will make their way into the trees even suitable ground is available for burrows. Shrews also live in the forested regions. Perhaps unique among these small mammals in the Hudsonian range are the Mackenzie Red Squirrels, and a rare relative in the form of the Hudson Bay Flying Squirrel.

Canadian Life Zone.

Only a few mammals are not common to the entire forest covered lands of Mackenzie valley, and these are the ones confined to the Canadian Life Zone. Mule deer (Alces americana Clinton) were once found north of Fort Simpson, and Wood Bison (Bison bison athabasca Rhoads) ranged north just over the Mackenzie river to the south slopes of Horn Mountain (Anderson, 1937, p. 103). Both these beasts were probably once important items in the livelihood of the Slave Indians, but they seem to have diminished in importance after the fur traders settled in the region. Perhaps two circumstances, namely, the introduction of fire-arms and the fact that the upper Mackenzie region is on the northern extremity of the range of both deer and

bison, combined to force the retreat of these animals towards the south. Woodchucks or groundhogs have ranges restricted to the upper Mackenzie and Liard valleys; Fort Simpson seems to be their northern limit. The small mink-like fisher occupies the same range, and other mouse-like creatures enjoy the protection of the heavier woodlands.

FISHES

With the native population largely localized on the main rivers and tributaries and also along the sea coast, fishes of various types have been most important as a source of food. In some places fish is almost the entire diet and in other sections of the country, fish may be the sustaining food for long seasons. The patterns of movement of the Indians and Eskimos are linked in part to the availability of fish, and, in many instances, stocks of fish are saved both fresh and dried to carry over into times of the year when the fishery is not so productive. Every year great quantities of these animals are harvested and have been for centuries. It is a resource which seems to have withstood the native using his primitive methods, and even into modern times with new skills and equipment, the fishery of the Mackenzie region has kept pace with utilization.

Along the Arctic coast on either side of the Mackenzie River is a special aquatic environment which must influence the type of life that survives there. Vast quantities of fresh water, that is especially muddy, are poured into the Beaufort Sea and dilute substantially the surface sea water causing it to become brackish rather than salt over a large area near the delta. Similarly the Eskimo Lakes, at least at their upper end, are quite fresh from

stream flow during the summer. Anderson River contributes much fresh water to Liverpool Bay, with the net result that the coastal waters of the Mackenzie region are of low salinity in spring and summer. Salt water fish tend to avoid these brackish areas except for those fishes which use fresh water streams as a habitat for breeding. Tom Cod (Microgadus proximus Girard) is one species which is more abundant away from the fresh water where it is caught by the Eskimos (Anderson, 1951, pp. 445-446). Locally along the coast California Herring (Culpea pallasii Cuvier and Valenciennes) occur for a short period; at Cape Bathurst and Baillie Islands these fish arrive in great numbers in the latter part of August, and are taken in quantity with long sweep nets by the natives. Eskimos maintain that these fish did not come before the white men but R.M. Anderson claims the explanation is that herring schools are periodic and are not always close inshore. Thus the natives might have missed their short run (ibid., p. 452). There are other fishes which are like herring and are plentiful in the Mackenzie drainage but local names lend confusion to the pattern of their distribution.

In Great Bear Lake Richardson identified Leucichthys lucidus as being products of the fisheries at Fort Franklin (Anderson, 1937, p. 125). Miller in a much later survey (1945) reports Ciscoes (Leucichthys artedi Le Sueur,) in great numbers at this same fishery (Miller, 1947, p. 39-40). Both these subspecies are known as Great Bear Lake Herring and both resemble the "Tullibee" of the northwest. Since they are all of the same species, they will be referred to as ciscoes. Ciscoes are plentiful along the coast and taken by nets all summer (Anderson, 1951, p. 451). They are also caught up the

Anderson River and presumably in the Kugaluk River as well as the Mackenzie. Ciscoes are abundant at Arctic Red River and at the Ramparts where the fishery lasts from June until late September (Wynne-Edwards, 1947, p. 26-27). Ciscoes also occur in Great Bear Lake, the upper Mackenzie and Great Slave Lake where they are also common.

When Mackenzie explored the Grand River in 1789, his voyageurs caught a fish which was entirely new to them and they dubbed it "inconnu". This name is still the one used although it is often abbreviated to "connie". The Inconnu (Stenodus leucichthys nelma Pallas) is the only fish-eating white fish. It is found in the Yukon and Anderson river systems as well as throughout the Mackenzie drainage. On the Mackenzie it is common and is relatively more important in some stretches of the river, probably because of the relative lack of other fish (ibid., p. 26). Under these circumstances the Inconnu are welcome as food for man, but in other districts, notably along Great Slave Lake, "connies" are thought better fit for dog food. It is indeed caught in quantity for just that purpose.

The abundance of Whitefish (Coregonus spp.) in Mackenzie River and the two great lakes makes these fishes important sources of food. Most whitefish are Coregonus clupeaformis (Mitchell) although the species exhibits a variation in shape from smooth to humped backs. These fish spawn in the autumn on shallow, gravelly areas where streams enter or leave the lakes. In this way they are important items of the winter food supply for they may be taken in the autumn and frozen fresh for winter consumption. The Big Island fishery of Great Slave Lake harvests many white fish in September before freeze-up

and fishing often continues into the early winter.

There are other but less important fishes to be taken in the Mackenzie River and its tributaries. Northern Pike or Jackfish (Esox lucius Linnaeus) is a sports fish through the northern hemisphere but a food fish as well. Almost all the lakes and streams of note in the Mackenzie region have this species and locally, especially the central Mackenzie River, it is quite important for food. The Northern Sucker (Castostomus castostomus Forster) is abundant in the valley and it is often taken by winter fishing under the ice. Other suckers are caught also. In the upper river are two other fishes; one is called the Pike-Perch (Stizostedion vitreum Mitchell) and the other is the Goldeye (Hiodon alosoides Rafinesque). In addition the Loche, Methys or Ling is found from the coast upstream to the lakes. The Ling (Lota maculosa le Sueur) is a fish not much prized as food, for dogs will not eat it. The liver and roe, however, are delicacies (Prebles, 1908, p. 515).

The two great lakes, Great Slave Lake and Great Bear Lake all have Whitefish, Ciscoes, Jackfish, Inconnu and Suckers just as the Mackenzie River does. These lakes of clear water, and the streams issuing from them, are host to other fish which prefer clear water conditions. Lake Trout (Cristivomer namaycush Walbaum) may be taken occasionally in the Mackenzie River, but it most commonly occurs in the lakes of the region. It is well represented among the fish population of Great Bear Lake. (Miller, 1947, p. 37). It is also present in quantities suitable for commercial exploitation in Great Slave Lake (Rawson, 1947, p. 67). The "blue fish" or Grayling (Thymallus arcticus Cope) also is plentiful in clear streams and

lakes and is both a sports fish to be taken on the fly or as a source of food taken by nets. It remains to be reported that Pacific Salmon reach the Mackenzie in very small numbers but the occurrence is accidental (Prebles, 1908, p. 509). In addition, the streams west of the Mackenzie delta have yielded specimens of Speckled Trout (ibid., p. 511).

BIRDS

The seasons of the year control strongly the pattern of bird life in the Mackenzie region. Winter's cold and darkness are too inhospitable for most birds which are of consequence to aboriginal man. The exceptions are Ptarmigan and Grouse which inhabit the country all the year around. Ptarmigan are common in the northern part of the region and are welcomed as food by Indians and Eskimos especially in the lean days just before the coming of spring when game or fish are scarce. Snowy Owls and the small birds like Canada Jay and Snow Buntings remain through winter but are of no concern to the Indians.

During the spring, summer and autumn the Mackenzie region is fairly alive with bird life when migratory species come to the region to breed. Of all these birds, waterfowl play the most important part in the life of the aboriginal inhabitants. Migratory birds arrive in the far north near the coast from the first week in May through to the end of June. They seem to follow along the general course of the Mackenzie River or fly directly from Great Slave Lake to Great Bear Lake and then to the coast. (Höhn and Robinson, 1951, p. 117; Höhn, 1959, p. 103). The whole of the Interior Plains region seems to be the general flyway, for it is liberally covered with lakes for the waterfowl, and land birds

easily find resting places and nesting places anywhere in the trees.

A most extensive collection of all the bird observations in the region was produced by E.A. Prebles (1908) and is still an outstanding summary in which over 290 species of birds are discussed in relationship to the Athabaska-Mackenzie region. An earlier checklist of 191 species, 30 of which were winter residents, was presented by B.R. Ross in 1862 for the Mackenzie River District. (Ross, 1862).

Waterfowl

Of the smaller waterfowl, Loons, Mallards, Teal, Pintails, Canvasbacks, Scaups, Oldsquaws, and Scoters are the most prominent in the population. All are killed for food with some being desired above others; for instance, the Dogribs relish Loon meat. (Prebles 1908, p. 255). The larger waterfowl are important too. The Lesser Snow Goose or "Wavey", Whitefronted Goose, and Canada Goose are prominent visitors to tundra lands; these birds are only available to the natives of the interior during the migration periods. The Black Brant is seen only in the northern portion of the district because it migrates from Alaska rather than over the central part of the region. (*ibid.*, p. 308; Hohn, 1959). Whistling Swans nest near the Arctic coast and are significant items in the native diet.

Most waterfowl during the nesting period endure a moult of their feathers, and are unable to fly. They are, of course, at this time thin and worth very little as food; but birds which cannot fly are easier to catch. Young birds are taken by the natives just before they have graduated to the flying stage and egg gathering in early summer is common activity for the women and children.

Ducks and geese occupy distinctly different habitats, for their

food supply and nesting conditions differ somewhat. Bog lakes, those which are drainage pockets in muskeg country, are not good places for waterfowl except as resting places in long migrations. Fresh replacement of water is required to ensure good growth of aquatic food for the birds. Thus areas like the Mackenzie delta are especially good as breeding grounds where lakes and channels of many sizes are replenished with fresh water, and yet offer protection for nature's design. Usually the seclusion of the inner lakes is sought out by ducks, but the channel bars with a fresh layer of alluvium and growth of goose grass (Equisetum variegatum) are inhabited by geese (Lynch, 1947). On the outer delta where both alluvial and tidal deposition takes place, the same sort of habitat preferred by geese and larger waterfowl is present. (*ibid.*, p. 20). Thus the population of the delta is different from the coast. For instance, a recent survey of birds gives this census: Mackenzie delta - Swans, 5800, Canada Geese 2000, Snow Geese 7500, Pintails 31,000 and Mallards 2500. On the coast towards Liverpool Bay and in the Eskimo Lakes region White Fronted Geese 5400, Pacific Brants 3000, Whistling Swans 1500, Pintails 500, Mallards 200. (Barry, 1960, p. 55).

Other Birds

The Passenger Pigeon, was once quite common in the southern part of the Mackenzie region, but is now extinct. At one time it was sufficiently numerous to be a real pest to early gardeners by molesting the grain crop at Fort Simpson, (Prebles, 1908, p. 351). This bird may have been an important food bird to natives before it disappeared. Among the ubiquitous species is the raven, commonly

called "crow" by the white people of the valley, and various species of owls. In summer anywhere near water will be found the Herring Gull and a few others of its relatives frequent the region down to the coast. Jaegers are also common in summer. These birds which nest in rookeries like the Arctic Tern are sought after for their eggs. Eggs found anywhere are regarded by the natives as pleasant diversion and are gathered in quantity from nesting colonies (ibid., p. 273).

CONCLUSION

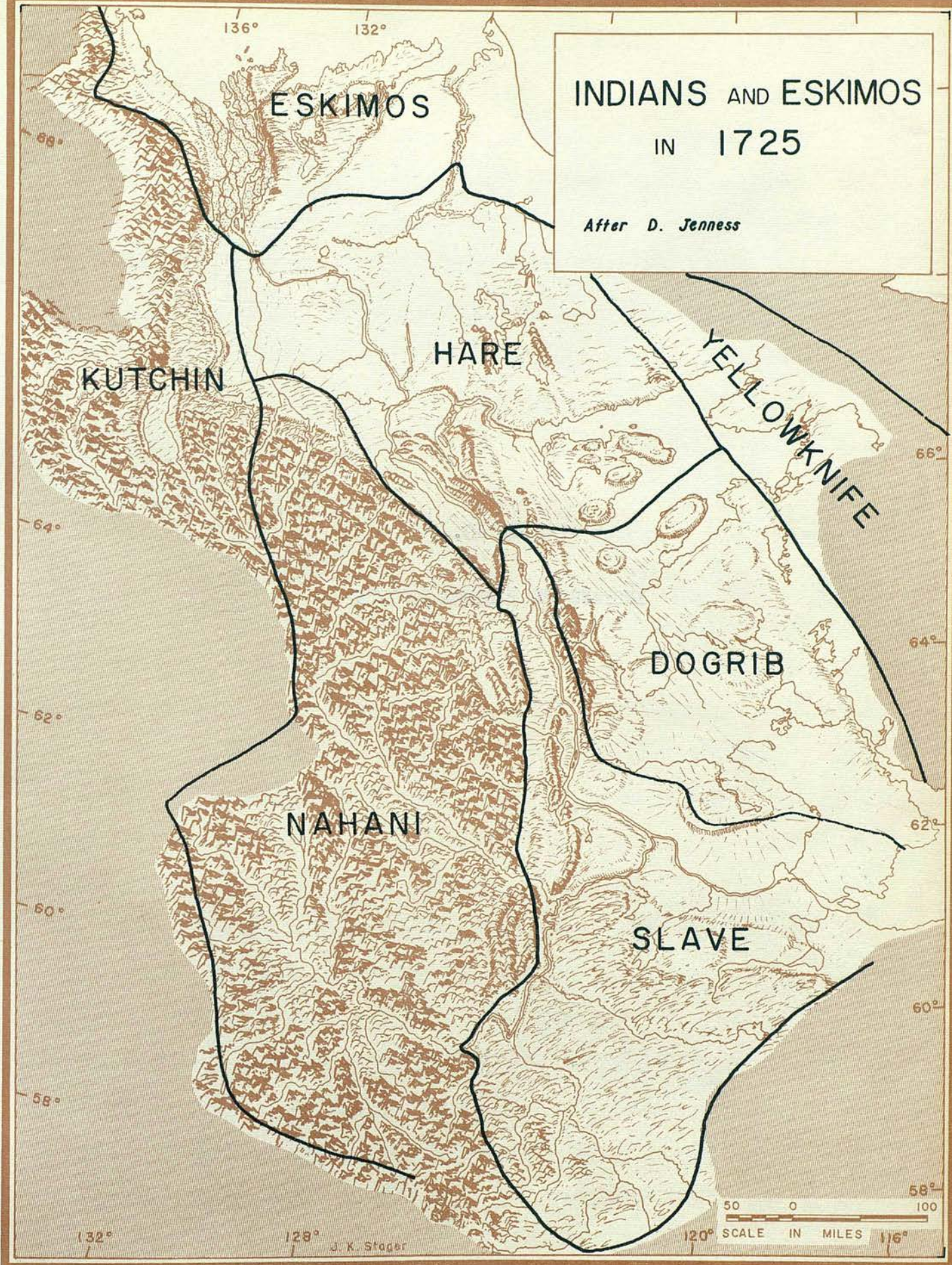
It may be seen then that the great wealth of animal life - mammals, fish and birds - coupled with the poverty of the soil, ubiquitous forests and bogs, and a climate restrictive for crop raising, made the Mackenzie basin from early human times to the present one of the great hunting and fishing areas of the continent. Other areas to the south, such as the buffalo-rich grassland plains, may have been richer in game, but they were also better suited to agriculture, and it swiftly passed from a land tributary to the fur trade into one of farming and industry. On the other hand, the Mackenzie country, isolated and unattractive to settlement, continued to be uniquely the home of fur-bearing animals and the stronghold of the hunting life. In spite of some modern development associated primarily with mining, trapping and the fur trade still continues to be significant in the lives of most of its inhabitants.

II. THE HUMAN ELEMENT

MACKENZIE VALLEY NATIVE POPULATION IN 1750

At the time when the white men began to penetrate the Mackenzie region almost the entire valley was inhabited by Indians who were woodland people. Except for brief excursions onto the barrens for caribou or musk oxen, Indians avoided the open country. In this way they also avoided contact with the people of the tundra and the coast, the Eskimos. There is a long history of rivalry between these two distinct nations, with frequent bloodshed as revenge followed revenge. Both peoples were so well adjusted to their own environments that it was inviting disaster to stray from known countryside. Separation therefore, was easy and complete under a state of complete lack of trust of each other and with such profound inability of each nation to survive in the territory of the other.

The Indians were all of the same linguistic group, and spoke regional dialects of Athapaskan. The dialects were sufficiently alike to allow communication between neighbours (Richardson, 1852, p. 246). Each language group was tied geographically to a special section of country. Thus with definite limits to the hunting grounds of each tribe, separate characteristics developed which became linked to the people and the place where they lived. The life of the Indians was essentially a mobile one in pursuit of game, and although this mobility was confined to the ~~tribal~~ hunting grounds of the tribe and so the outer limits were only changed by war with the neighbouring group. Presumably in prehistoric times the pattern of occupancy of territory was settled by conflict with the choicest locations belonging to the most efficient and numerous warriors, and in turn such strength was in direct relation to the resources of the country



where they lived. By comparison, therefore, the environment along the Mackenzie River had less to offer than the bountiful plains where buffalo and later horses meant supreme independence. The result was a natural pressure of the Northern Athapaskans towards the south. (Jenness, 1960, p. 377). As the fur-trade spread from Montreal and Hudson Bay towards the Mackenzie region the influence from Indians turned trader and Indian fur-hunters tended to move north to counter the southward pressure so that the winds of change were felt long before the European actually put in an appearance on the river.

Chipewyan Indians made the dangerous and fatiguing journey across the northern fringes of the forest to Churchill and there traded their furs. Gradually the articles of trade, probably bits of iron or old implements, were passed on to less suspecting and more remote tribes at exorbitant prices. In this manner the Chipewyans on the western fringes of their own territory became significant as middlemen. (Innis, 1956, p. 202). They also pressed the northern Athapaskans - namely the Dog-ribs and Yellowknives - westward and northward soon after they gained possession of fire arms. Their purpose was to seize new, productive hunting grounds and to prevent the distant people from going to the trading posts (Jenness, 1960, p. 255). The Cree were even more aggressive. They too possessed guns and with them conducted extended hunting and plundering forays to the Slave, Peace and Mackenzie rivers (ibid., p. 254). The Cree nation was strong and numerous enough to displace the Chipewyans and drive them to the fringes of the forested zone (Mackenzie, 1801, Vol. 1, CXVII). This done, Cree Indians met

another Athapaskan group occupying the region between Lake Athabaska and Great Slave Lake. With this encounter the vanquished native, now called "slaves" by the Cree, withdrew from Slave River to the west end of Great Slave Lake. When Mackenzie reached the Grand River in 1789 these events were fairly recent, for his guide claimed the war was "several winters ago," (Mackenzie, 1902, pp. 215-16). At about the same time, the Cree followed up the Peace River to the west. They were always victors in wars over the defenceless Beaver Indians who in their retreat in turn displaced the Sekani Indians into the mountains. (Jenness, quoted in Swanton, 1952, p. 552). Cree war parties were also on the Mackenzie near to the mouth of Liard River in 1782-83 (Mackenzie, 1902, p. 225). Prior to Mackenzie's journey, however, a plague of smallpox seriously weakened the Cree so that some of the Chipewyans were able to return back to Slave River and the country around Lake Athabaska. These events - trade, guns, warring Cree and disease, - all combined to disrupt and eventually obliterate the geographically stable subdivisions of tribes or bands and broke down the dialectic differences. As a consequence, it is a difficult task to be accurate concerning the distribution of native Indians in the immediate pre-European era on the Mackenzie River.

At the mid-eighteenth century six tribes of Indians lived within the Mackenzie River drainage (Jenness, 1960, p. 318). Four of these tribes, Slaves, Dogribs, Hare and Yellowknives were people living in the Mackenzie lowlands on either side of the river or on the edge of the Canadian Shield. Two tribes, Nahani and Kutchin or Loucheux were mountain dwellers on the eastern ranges of the Cordillera. The

physical characteristics of these Indians are remarkably uniform throughout the entire country. Everywhere the skin is the same shade of yellowish-brown, and abundant straight, black hair on the head is characteristic. In contrast, hair on other parts of the person is sparse. The Indian's eyes are medium to dark brown and often obliquely set. Children frequently have the "mongolian fold" in their eyes and sometimes this persists to adulthood. Faces are wider than the European and high cheek-bones are prominent features. The limbs are well-proportioned, although there is a tendency for hands and feet to be smaller than the white race. The heads of people in the Mackenzie basin are brachycephalic or round-headed (ibid., p. 2). In overall stature, the Indians are medium height, and tall men are perhaps more common among the Yellowknives (Ross, 1866, p. 304). The differences, therefore, between peoples in the Mackenzie Valley do not seem to be of a physical nature, but mainly dialectic and in habits of dress and mode of life.

Etchaottinne is the name by which the Slave Indians referred to themselves. The significance of the name lies in the interpretation "people of the lowlands" with the suffix "tinne" meaning "people" (Hodge, 1913, p. 152n). This tribe is known through history as the Slave or Slavey Indians, which name was a translation of a Cree word used as a gesture of contempt. The Slaves at one time occupied a wide area around Great Slave Lake even south to Lake Athabasca. They also ranged north along the Mackenzie River to Great Bear River and generally hunted throughout the countryside tributary to these water bodies. Later as a result of Cree aggression they came to be located around the western end of Great Slave Lake, on the Mackenzie

River and along the lower Liard River. (Map 19). There is some suggestion that these shifts in tribal territory caused some intermingling of peoples where the Slaves and Beaver Indians from Peace River joined fortunes along the Liard River (Keith, 1890, p. 68). In 1807 the natives of "The Forks" (Fort Simpson) claimed to be Beaver Indians, but the traders recognized differences which set the Slaves apart (Wentzel, 1889, pp. 85-86). In temperament they were not regarded by the whites as war-like but in the early days of the fur trade these same Indians wreaked havoc among the Nahani nation and drove them from the Upper Liard region into the mountains. (*ibid.*, p. 86) (Jenness, 1960, p. 389). Docility grew, however, as the fur trade became firmly entrenched as part of their way of life. In pre-white times, the population of Slave Indians has been estimated at 1250 persons (*ibid.*, p. 392).

North of the Slaves and over the interior region between Great Slave Lake and Great Bear Lake lived the Thlingchadinne which signified "dog-flank people" (Swanton, 1952, p. 604). The name originates in a legend which tells that these people are descendents of a woman and a supernatural dogman (Petitot, 1891, p. 296). The Dogribs, as they became known, first appear in history in 1744 when they were said to occupy the Seal River living on muskoxen. Scattered references trace them to the source of the Churchill River and later in the Mackenzie basin. All the time they seemed to be elusive people avoiding contact with the northern Cree. (Hodge, 1913, p. 454). Such early references appear to be largely on the basis of rumour and not of white contact with the nation. In fact, one reference coupling the word "copper" with the Dogribs would suggest

that they lived near Coppermine River in earlier times (Jenness, 1960, p. 426). It seems, however, the Dogribs nation had some history of migration towards the northwest that was either the direct or indirect result of fur trading from Hudson Bay. In the period immediately prior to the arrival of Europeans on the Mackenzie River, the range of the Dogrib appears to have been stabilized between the two great lakes of the northwest, but not over to the Mackenzie River, (Map 19). Occasionally the boundaries of their territory fluctuated, usually allowing expansion to the northeast where conflict occurred with Yellowknife Indians. Relations were better with the northwestern and southern neighbours because frequent mixing of families and overlap in hunting took place with the Hares, and Slaves. Within the hunting territory these people were loosely organized into bands that kept to a certain segment of the country, and like the Slaves in this respect, they gained local names for the small groups that identified them with a geographical area. Dogrib Indians in general led a life that was really a compromise between the more sedentary existence along the main river and the wide-ranging way of people on the forest-tundra margins. Estimates of the numbers in this nation say that there may have been 1250 individuals in pre-European times (ibid., p. 393).

The people that lived on both sides of Mackenzie River below Great Bear River called themselves Kawchodinne or "people of the great hares" (Swanton, 1952, p. 574). From this name the translation ultimately was shortened to the single term Hare Indians. The tribe hunted north to the tree-line in the vicinity of the upper Anderson River and on the north side of Great Bear Lake. On the west side of

the river they hunt to the base of the mountains. First historical contact with the Hare people occurred when Alexander Mackenzie made his voyage in 1789 (Mackenzie, 1902, p. 246). At this time they were camped along the Mackenzie River above the Ramparts. Seldom did they venture much farther downstream for fear of meeting the Eskimos, who, on occasion, came up the river in search of flint. In fact, the Hare Indians had a reputation for timidity among the neighbouring tribes (Jenness, 1960, p. 394). Within their country, they too were loosely organized into bands of which there were five or six in the late 1800's (Petitot, 1891, p. 362). Those living on the margins of the forest depended more upon the caribou while other groups at the edge of the river caught considerable quantities of fish. The entire nation, however, was well known in its habit of making rabbit a substantial element of its diet. This feature set them apart as much as any other characteristic. The Hare Indians were never thought to be numerous and an estimate of 750 people has been accepted as reasonable for the pre-European times. (Jenness, 1960 p. 396).

Although most of the area in the Mackenzie drainage east of the river was occupied by the Slaves, Dogribs and Hare Indians, the outer rim to the east on the edge of the barren grounds was the territory of the Tatsanottinne or Yellowknife Indians. In general, their hunting grounds were north of the east end of Great Slave Lake and they occasionally hunted near the east end of Great Bear Lake. More of these people frequented the upper Coppermine River and it is the association with this river for which they are best known. The name Tatsanottinne means "people of the scum water". (Swanton, 1952,

p. 603). The natives used this phrase - scum of water - to describe the reddish-yellow iridescent sheen of unoxidized copper. Lakes that are badly drained develop a dark, reddish colour and when seen in a certain light, the surface presents an appearance not unlike the iridescence caused by oil spreading across it. Thus, scum came to mean copper. The Yellowknives tell an elaborate legend of how they came to possess the copper that occurs in native form near the Coppermine River. Before the products of European trade reached the region of the northwest, the Yellowknife Indians at the cost of living in a hostile environment manufactured knives, spears and arrow tips for exchange at very favourable rates. They then held power and wealth from this source but had to defend it against the Eskimos. However, the coming of iron and steel made their source of wealth vanish and the Indians withdrew southward. (Hodge, 1913, pp. 448-9). Later wars against the Dogribs brought about the retreat of the Yellowknives from the country around Great Bear Lake, after a final and decisive conflict in 1823. Before this, however, Dogrib and Hare Indians both experienced much humiliation at the hands of their opponents (Jenness, 1960, p. 389). Pre-European population of the Yellowknives is estimated at 430 (loc. cit.)

Of the two Indian tribes that lived in the mountains, the southern people were the Nahani - "people of the west" (Swanton, 1952, p. 583), or "people over there far away" (Jenness, 1960, p. 427.) There is some confusion as to what people the tribal name embraces. Jenness (1960) divides the nation into two groups. One group (Kaska), calling themselves "the mountain people" and "the big-water people" lived in the region drained by the Liard River somewhere north of Fort

Halkett and centred around Frances Lake. The second group were people who were known as the Goat Indians and lived in the valley of the South Nahanni River but also ranged over the divide to the very headwaters of the Pelly drainage. These natives seem to be the ones who later made regular trading trips via Keele River to the Mackenzie River. Doubtless they are the natives which the Mackenzie River Indians called "people in the air," or referred to by Mackenzie simply as the Mountain Indians. (Hodge, 1913, p. 151; Mackenzie, 1902, pp. 83, 85). At the time of Mackenzie's voyage there was genuine fear of the Nahani Indians who were always represented as being huge in stature and in possession of powerful magic. (*ibid.*, p. 297). Even in the early twentieth century, the natives of Great Bear and Great Slave Lakes feared the Nahanis as a mythical tribe haunting the countryside (Jenness, 1960, p. 427). The Nahanis of the Mackenzie Mountains appear to have lived far up the valleys and hunted westward across the passes or occasionally eastward down to the Mackenzie River. In pre-European times the population was probably about 1500, with perhaps 300 of these living in country tributary to the Mackenzie River (*ibid.*, p. 399; Swanton, 1952, p. 585).

In the northern mountains lived a people called Kutchin Indians. This name means "people" and corresponds to "dinne" or "tinne" of the other Athapaskan tribes along the river (Jenness, 1960, p. 399n). The Kutchin nation was made up of several bands some of which occupied the lower stretches of the Peel River and portions of the upper delta of the Mackenzie River. The latter known as "those who dwell in the flats" later spread farther to the east between the Hare

Indians and the Eskimos. Some of them gradually intermixed with the Hare people and rejoiced in the name of Batard Loucheux (Hodge, 1913, p. 328). The term Loucheux refers to the "Squint Eyes" or "slant eyes", a physical feature which these people are supposed to possess. Probably these are the Kutchin natives whom Mackenzie met on the famous journey to the Arctic sea and to whom he gave the name Quarrellers, (Mackenzie, 1902, p. 254). Upstream on the Peel River system there lived another band, "the people who dwell at the source of the river" (Swanton, 1952, p. 603) and these probably had infrequent contact with the Nahani nation farther south. Immediately west of the lower Peel area is a low pass to the headwaters of the Porcupine River, and through this section of country ranged natives who quickly assumed the role of middlemen when European influence penetrated from the south and from the west (Hodge, 1913, p. 489). Western representatives of the nation occupied the basin of the Porcupine River and downstream to the region surrounding Fort Yukon in Alaska. It appears that the individual bands of the Kutchin Indians were more independent of one another than the other Athapaskan tribes, perhaps reflecting the relative isolation within geographic areas that was dictated by the rugged terrain. These people occupied the intermediate ground between the Eskimo to the north and the culturally advanced Coastal Indians in the west. The Kutchin way of life is full of adaptations borrowed freely from both sources. Techniques of travel, styles in clothing, and implements came from the north, but their social organization was modified by western influence. The Kutchin or Loucheux on the Mackenzie side of the divide felt this latter influence less. In pre-European times

the Kutchin population has been estimated to be 3,000 persons, and of these, perhaps 800 or more frequented the eastern slopes of the divide. (Jenness, 1960, p. 404; Swanton, 1952, p. 603).

Eskimos

Although frequent mention of the Eskimos is made in this thesis, because of their impact on the northern Indians, they are not given comparable treatment since, before 1850, they played no part in the fur trade of the Mackenzie basin. It is true, of course, that whites had made contact with the Mackenzie Eskimos living along the tundra coasts, but these were the explorers like Franklin and Richardson who were interested in discovery rather than furs. The traders themselves at this time had not seen Eskimos; although the Hudson's Bay Company had successful Eskimo trade in the Hudson's Bay, it was not until the second half of the nineteenth century, when the Mackenzie delta and the Anderson River were used as bases for the developing trade of that coast, that white men began to integrate the life of the Eskimos into that of the Mackenzie basin as a whole.

ABORIGINAL MAN IN HIS NATURAL SURROUNDINGS

It is difficult to imagine how the native Indian regarded the resources of nature. When white influences reached the Mackenzie region the people were dependent upon the use of stone and bone implements, knew nothing of metal working except native copper which they treated as a malleable rock, and were scarcely at the neolithic stage that had developed in Britain two thousand years before Christ. Though they used neolithic tools, they knew nothing of agriculture, however rudimentary. When viewed from the present, the native life seems to have been hard and precarious, it was certainly lacking in imagination and wanting in inventive spirit. Judgements made now, however, must with great difficulty be free of prejudice caused by centuries of European civilization. It is too easy to suggest that North American native man was not further on the way to a higher civilization because of some inherent physical or mental shortcomings. If this were true, then the natives of the Mackenzie region were those who had the greatest handicaps, for they surely were the most primitive in Canada (Jenness, 1960, p. 22). It would be better to consider aboriginal man in the setting of his environment and examine the needs and hazards of living in such an environment to learn how the natives reacted to the specific challenge before them.

Food and Food-Getting:

Game Animals.

The Indians had as their first need sufficient food for the normal maintenance of life; if it was in abundant supply, then living conditions could be pleasant. In order to feed a family it was desirable to take some animal, like a moose or bear, which

provided a great quantity of meat for less effort compared with the hunting skill and energy necessary to gain equal nutrition from smaller beasts. Accordingly big game was more desirable than small unless the small was so plentiful that it was easier to depend upon it. Generally, too, the large game had much more fat for a healthy diet; taste of the food was a small consideration. Other by-products of the chase, such as hide and sinew, horn, bone, teeth and claws, found many uses in the aboriginal way of life. Flesh alone was not the sole object of hunting. In the Mackenzie region the most desirable big game were moose, woodland and barren-ground caribou, mountain sheep and some small deer. The ranges of these beasts did not coincide. The Slave Indians living in low marshy, wooded country around the foot of Horn Mountain and over in similar terrain at Kakisa Lake found moose in abundance, and on the uplands south of the river encountered small deer. Dogrib Indians moved with the caribou through the transition forest following them north to the barrens in the summer and waiting for them to return to the trees in winter. Yellowknife Indians also moved with the caribou, but, unlike the Dogribs, would continue onto the barren ground for the summer hunt. West of the Mackenzie River the Mountain Indians, Nahani tribe, hunted woodland caribou and mountain sheep. The Loucheux or Kutchin people alternately searched for sheep in the mountains or caribou on the open tundra. Some of these people ventured to the Mackenzie delta after moose. The Hare Indians came to occupy a territory west of Great Bear Lake, which was not abundantly supplied with these large animals, and although they did hunt moose and caribou, most of the hunting effort was spent catching rabbits.

Hunting Methods

To become a successful hunter the Indian youth had many skills to acquire, not the least of which was an intimate knowledge of the quarry he sought. Moose, he found, moved about the countryside as individuals and did not herd; moreover, they usually stayed within the trees. Occasionally they might be found in bands of two or three, and only in the mating season in autumn were they liable to be dangerous. Moose liked to feed on willow and birch twigs and in summer gathered roots and stems of aquatic plants. Armed with this lore, and considerably more, the Indian hunter knew the places moose frequented, and could, by signs of grazing, tell the nearness of animals. The shrill bugling noise that moose make as a mating call was sometimes imitated by the native with the aid of a roll of birchbark, or he might "rub the shoulder blade of an elk (moose) against a tree, at the same time imitating the cry of an elk; this brings the animal quite close when they are easily killed with bows and arrows." (Wentzel, 1889, p. 83). At other seasons of the year Indian hunters learned to use other methods. In winter, and particularly close to spring when the snow was deep and its surface armoured with a glaze formed by melting and refreezing, the hunter was able to travel swiftly over the surface of the snow. A large moose cannot be supported by the crust but lunges through deep snow at a much reduced and fatiguing pace. The hunter easily overtook his quarry and dispatched it with arrows or a spear. The Indians of the Mackenzie had small domestic dogs which helped to corner animals, this being the only use made of dogs. (Richardson, 1852, p. 257). The light snowfall of the region meant that snow deep enough for

running down animals came only in late winter, and if the snow failed, the Mackenzie natives were not greatly skilled in other methods of hunting beasts that moved about the country as individuals. (Keith, 1890, p. 117). The most widespread device for catching game in the country was a simple snare composed of plaited rawhide or "babiche". Elaborate guidance systems constructed by erecting stakes and other impediments in the woods, were developed to conduct the unwitting animals into the snares. Thus the game was directed to a single opening at which a snare was suspended to entangle the head and antlers (H.B.Co., Reports on Districts, Mackenzie's River, 1822-23, p. 5). Some hunters, notably the Slave and Dogrib Indians, knew the habits of the animal described so well by David Thompson. "It (moose) is of a most watchful nature; its long, large, capacious ears enable it to catch and discriminate every sound; his sagacity for self-preservation is almost incredible; it feeds in wide circles, one within the other, and then lies down to ruminate near the centre; so that in tracking of it, the unwary, or unskilled hunter is sure to come to windward of, and start it; when, in about two hours, by its long trot, he is at a distance of thirty or forty miles from where it started; when chased it can trot (its favourite pace) about twenty-five to thirty miles an hour." (Thompson, 1916, pp. 95-96). The hunter had to outwit the beast by employing a course of stalking which would avoid giving wind of himself, and a native may even in winter remove part of his clothing to keep from making any unusual noises (Osgood, 1932, p. 40). In summer, the moose grazing along lakeshores could occasionally be stalked and driven into the water, approached by canoe, then stabbed with a spear or

killed with an arrow.

The caribou is an animal that, unlike the moose, will move about in small herds. Thus native hunters when finding these animals, could, if skilful enough, secure several of them to provide food and other supplies for an extended period of time. Furthermore, the caribou, when it was more plentiful in the past, moved with the seasons along routes easily found by Indian hunters, so that these beasts were staple items of livelihood. East of Mackenzie River the barren-ground caribou migrated in spring from within the trees to the tundra lands along the coast and returned before the winter became too severe. Thus natives like the Dogribs and Hare Indians sought out and followed the herds to the edge of the trees. Rarely did they venture beyond because they were afraid to be without fuel on the treeless barrens (Jenness, 1960, p. 393). The Yellowknives, more used to the barrens, followed caribou during summer to a certain extent. In the region about Horn Mountain and on the west side of the Mackenzie River, woodland caribou lived and provided year around challenge to the Slave and Nahani people. In the north, the Loucheux were lured by caribou out onto the Yukon tundra where these animals were once plentiful (Stefansson, 1913; p. 449). Caribou therefore, were killed by all the aborigines of the Mackenzie region who used several different methods in achieving these ends.

With caribou to be found in herds rather than as individuals, it was more efficient to be able to kill as many animals as possible at one time. Therefore, an individual hunter on his own might be able to take one or perhaps two from the herd, but a group hunt

could be more profitable. Gradually there developed methods for mass slaughter. During migration times the Indians, particularly those venturing on to the barrens, rounded up the animals by "beating" large sections of country, and drove them to preferred locations such as lakes, where, as they were forced to swim across, hunters killed them easily from canoes (Morton, 1939, p. 7). Within the trees Indians built corals or pens with widening jaws stretching outward. A man and his family attempted to drive the caribou into these enclosures built of trees and brush, and if successful, they completed the kill with arrows and spears (Osgood, 1932, p. 41). The Loucheux Indians took more care with the preparation of pounds and at the entrance of the enclosures implanted pointed stakes so that the approaching animals would impale themselves (Richardson, 1852, p. 232). Careful setting of these stakes must have been quite laborious for the country of the Loucheux is underlain by permafrost. The natives at the north end of the Mackenzie region bequeathed the constructed pounds as heritable possessions, and in 1850 or so many were judged to be a century old. (loc. cit.) Apparently, ownership of hunting devices or grounds was not practiced elsewhere in the region, certainly not around Great Bear Lake or by the Slave Indians (Osgood, 1932, p. 41; McLean, 1849, vol. 2, p. 250).

A lone hunter often pitted his skill against the caribou herd by using a caribou skin and a set of antlers on a stick to approach the animals. With these props and some cunning in imitating the grazing actions of the beast he might get right among the herd to choose the fattest animal. Sometimes two hunters acted together, one being the forward end and the other the back end of the animal

they imitated (Franklin, 1823, p. 244). Once a herd was attacked the curiosity and confusion of the survivors often caused some of them to run toward the hunters rather than away, and in this way more might be taken (Osgood, 1932, p. 40). In late winter with deep snow the caribou were run down by men on snowshoes. It was most common, however, among the tribes of the Mackenzie simply to snare the animals. Snares of twisted rawhide were suspended at openings in a brush maze and hunters concealed themselves nearby ready to kill the caribou as soon as it was caught. The snares were tied by the Indians "upon a small tree on the track of the animal, which, when taken, carry off the sling until the little tree to which it is fastened happens to catch against or between two large trees. The animal when finding itself stopped, makes such efforts as to put an end to its life". (Wentzel, 1889, p. 81).

Other ungulates lived in the region and were taken for food. The wood buffalo ranged in the same country around the west end of Great Slave Lake north to Horn Mountain, and also in the valleys of the southern tributaries of Liard River (Preble, 1908, p. 144). The Indians used the same methods to catch buffalo as they used to take caribou, i.e. pounds and snares. Buffalo were also driven into bogs where they could not move easily and fell victim to spears and arrows (ibid., p. 147). Larger caribou which lived on the lower slopes of the mountains were distinguished from the woodland caribou of the plain by Indians hunting in the Liard drainage, who also hunted mountain sheep found near the alpine zones of the mountain system. These latter animals were not as easy to catch for they roamed inaccessible areas and were warned of danger by their good

eyesight. It was necessary for the hunter to climb above the sheep and descend upon them. It was necessary also to have great patience to catch an animal whose sure footedness and agility in high mountains exceed that of man who lived on the lower slopes and in the valleys.

Once the large game was caught, the hunter first removed the tongue of the animal, a much esteemed delicacy, and returned to camp to have someone go back for the rest of the meat (Osgood, 1932, p. 41). Usually this meant the hunter's wife or other womenfolk since women did much of the heavy, unskilled work. If he killed a moose, the hunter might take the nose and tongue both, the former "though rubbery, is considered a great delicacy." (loc.cit.) The disposition of excess meat depended upon the season. If it were winter, no problem existed in preserving meat fresh and wholesome. The only difficulty was to keep it away from nature's meat-eaters like bears and wolves. The most troublesome animal was the wolverine whose strength and cunning defied almost all attempts to keep meat en cache. The Dogribs did this most successfully by inventing a device which was a platform with overhanging edges composed of logs too thick to chew through. The poles supporting the platform were stripped of bark and smoothed to discourage climbing. The overhang was the functional feature of the design. (Anderson, 1951, p. 525). In summer, meat was cut in strips by the women and dried in the sun later to be pounded for pemmican (Osgood, 1923, p. 41). Perhaps the practices of building a smudge fire to drive away flies from the drying flesh led to a peculiar but engaging flavour of the meat and engendered the practice of smoking meat as a means of preservation.

Fishing

Fishing was second only to hunting for food getting, and fish was a substantial part of the diet of the aborigines. Some fished more than others; the Slaves living along the Mackenzie River and around Great Slave Lake gathered great quantities so that nearly half their diet was of this food (Jenness, 1960, p. 389). The Dogribs, an interior people relished fish only slightly, although they were more apt to catch fish when they frequented the shores of Great Bear Lake (Osgood, 1932, p. 38). The Hare Indians were fishermen of indifferent skill and north of them the Loucheux stationed themselves in the proper season along the Mackenzie to gather their harvest of fish. In the mountains the Nahani Indians spent their time in the chase rather than fishing mountain rivers and streams. Although fish were taken by them, they never lived an entire season on it.

The implements used in the fishing were nets, hooks and lines, and spears. The northern Athapascans fashioned gillnets from willow bark which was rolled into thread (Mackenzie, 1902, p. 237). The nets were then woven or tied with most of the work done underwater to prevent bark thread from becoming dry and brittle (Leechman, 1956, p. 214). Mackenzie found long nets used for lake fishing and short ones that were set in the turbulent eddies of the river (Mackenzie, loc.cit.) Nets were set in the usual manner with floats and stones, and in winter were placed under the ice of the lakes. When the ice was strong enough to support a man, the net was extended by passing it along under the ice from one hole to another. The intervening holes would freeze, but the end holes were kept open for emptying the net of the fish. Fish had to be extricated from the net under water

or else both would freeze and hamper the entire operation. This was obviously excruciatingly cold work. (Osgood, 1932, pp. 38-39). Fish were also taken with a spear either through the ice, or during spawning times when certain varieties like the suckers ran into small creeks in large numbers and fell prey to spears. Spears were also used in conjunction with fish-weirs, but such devices could only be used in clear streams like Great Bear Lake River and not in rivers as silt-laden as the Mackenzie. (loc. cit.)

The Loucheux used fish baskets to trap fish that were guided into them by fence-like creations similar to the principle of the caribou pounds (Jones, 1872, p. 323). Some fish were taken on a single line of caribou sinew holding a baited hook, but this practice was followed mostly in winter through holes in the ice. (Mackenzie, 1902, p. 237).

Fishing in the Mackenzie region, and elsewhere in the Indian country, is a seasonal occupation. The Mackenzie River was a major source and during spring breakup, from the beginning of May until after the highwater caused by melting snows had abated, no fishing could be done on the river. Drifting ice and logs could ruin quickly the long hours of labour represented by the woven willow nets. At this time of the year many of the Indians resorted to small lakes back from the river (Franklin, 1828, p. 89). The Hare Indians frequented the string of long lakes east of the Norman Range. The Slaves fished in Blackwater Lake, Willow Lake, and Trout Lake or Great Slave Lake. Dogribs camped on the shores of Great Bear Lake, Lac la Martre, or the chain of larger lakes along the edge of the Canadian Shield. Fishing was mainly a summer occupation, and when

the water level subsided those natives near the "Grand River" took up stations along its course where the fishing was traditionally good. One notable place was the Ramparts above Fort Good Hope to which the Hare Indians went each summer and caught quantities of lake herring, inconnu and whitefish (Mackenzie, 1902, p. 243). The Loucheux camped along the lower Mackenzie, but did not go into delta for fear of the Eskimos who hunted and fished there. At Great Slave Lake a productive fishery existed on the north side of Big Island, and many Slave Indians spent summers nearby. The best season for this fishing was in the autumn when whitefish came into the shoal banks to spawn. Autumn fishing was good in parts of Great Bear Lake for this same reason. McVicar Arm of that lake near Johnny Hoe River was productive over much of the winter (Franklin, 1828, p. 80). Fishing at these places was interrupted by the freeze-up period, which in the rivers is rather later in the season than the time of year when the ice sets around the edges of the lakes.

Other Animal Foods

Many other items of the natural environment were food to the aborigines. "These Indians subsist upon every species of animal, bird and fish, making no exception from the elk down to the mouse; from the swan to the smallest bird, the crow even is not excepted, and all fish is deemed equally palatable. They have also the dirty custom of eating putrified and filthy flesh, such as animals that die of diseases or wounds, whether rotten, full of maggots or otherwise. And yet these savages are healthy, and few of them die of sickness, some live to such an advanced age as to see the third and fourth generation of their children." (Wentzel, 1889, pp. 89-90). Bears

were killed for food mainly during winter, when their flesh was better. (Jones, 1872, p. 321). It seems that bears were altogether respected and not hunted unless food supply was low. The best and safest hunting time, of course, was when the bear was hibernating, but they were not always easy to find. Among the Yellowknives the flesh of bear was scarce and certain taboos were attached to the eating of this flesh. (Keith, 1890, p. 108). Muskrats and beavers were both eaten, being caught by snares or nets placed near the entrances to their houses. Beavers were quite safe from hunters during winter as long as the aborigines were still using their own primitive tools because the mud and stick houses when frozen solid were difficult to enter. Occasionally shortage of game drove the natives to the difficult task of winter raids on beaver houses. Their easiest method of catching beaver was to destroy the dam, drain the lake or pond surrounding the house, and take the animals as they tried to escape. Both lynxes and rabbits were taken in snares and roasted. Rabbits were found throughout the timbered area but were most important as food in regions that were not well supplied with other more desirable game like caribou, moose or fish. It appears that the country of the Hare Indians had just these qualifications and these people learned to depend heavily upon hares or rabbits. Fish and rabbit flesh were the mainstay of diet. Clothing they made of rabbit skin earned the name of Hare Indians for these people. When rabbits disappeared, as they did every seven years or so, starvation and suffering followed. (Jenness, 1960, p. 394). Lynxes preyed on rabbits and were taken as food in the same territory. Ground squirrels were snared by the natives, especially the women and

children.

Any other animals killed for food or fur were not regular objects of the chase. For instance, a wolverine would be killed because it was despised by the Indians and because it forever looted caches and snares. Besides it was found that wolverine fur was a good trim for parka tops (MacIver, 1952). Starvation, of course, would increase the range of animals desirable for food.

Birds

Many birds formed food for the natives, chiefly the waterfowl which bred in great numbers during the summer months. Although there are many lakes in the entire region, the waterfowl had preferred places to breed, and thus it made some difference in the species of bird that was available to the Indian hunters. For instance, the Lesser Snow Goose, or "Wavey", breeds near the arctic coast, and could be hunted by the interior Indians only during migrations in May-June and August-September. Although various birds arrived and departed within these times, often an individual species would pass over the country in a few days, leaving, for example, only a couple of days to hunt "Waveys" or "Laughing Geese". In fact, there was often remarkable regularity observed in the migration of birds, for one assertion gives the arrival of geese at Peel River (Fort McPherson) between May 12 and May 15 without fail (Richardson, 1852, p. 303). Mallard ducks, on the other hand, bred on the Mackenzie River and in many lakes throughout the whole district. Birds were sought almost as much for their eggs as for their flesh. Near the northern limit of trees, barren ground nests of plovers and curlews were raided. Also, the Arctic tern nesting in colonies made egg gathering easy

even in the face of protesting parents. Ducks' and other ^{birds'} eggs were used when found. The process was, of course, a simple gathering technique that could be performed well by the women-folk of the family alone or in bands. Hunting of birds was a man's job and bows and arrows were used. Even the young sons of Indian hunters with small bows could catch birds, and this was usually the beginning of a hunting career.

Fruits.

Throughout the valley of the Mackenzie some variety in diet was possible towards the end of summer when various kinds of wild fruit ripen. Blueberries, salmonberries, cranberries, crowberries, strawberries, gooseberries, raspberries and wild currants were gathered by the women and were probably mostly eaten by them. Also a sort of licorice root was favoured by the Hare Indians in the spring, before it became woody. (Richardson, 1852, p. 135). Otherwise, vegetable food was never important to the Indians.

Clothing.

Success in hunting large animals of the region brought much more than the flesh for food. Indeed from these beasts the aborigines derived almost all the necessities of life as they lived it. After food, the need for clothing against the cold in winter, rain, and more especially, swarms of biting insects in summer, is second in importance. Even the simplest processes in primitive living required a wide range of implements and weapons. Caribou and moose were the means of supplying most of the raw materials. The following was written of the moose but might well apply to caribou, buffalo or sheep as well: "It is the creature that enables the natives to live...

it bears practically the burden of their support. Its delicious steaks are their staple food, but its nose or muzzle is a delicacy. Its hide furnishes the best clothing and moccasin leather, or provides snow-shoes that enables the hunter to kill more moose. Its back sinew is the sewing thread of the country, its horns and bones make tools; its hoofs can be converted into rattles, and its coarse bristly mane, six inches long, and white except the tips, furnish raw material for embroidery. When dyed with native dyes and skillfully worked into leather and birch-bark, these bristles are as effective as Porcupine quills - are indeed often mistaken for them by the uninitiated." (Seton, 1909, Vol. 1. p. 181).

Most clothing in the region was fashioned from caribou hides. The Hare Indians, however, made extensive use of rabbit skins by cutting them into strips, twisting them together and knitting garments out of the cord. (H.B.Co. Reports on Districts, Mackenzie River, 1825, p. 2).

Generally the costume consisted of a shirt, breech-cloth or some equivalent, leggings, moccasins, and in winter a covering blanket and some manner of head covering. (Jenness, 1960, p. 70). The Loucheux of the lower Mackenzie dressed slightly differently from the other natives. The general appearance of Indians in the Mackenzie Valley has been described as follows:

"Both moose and caribou skins were used for clothing. In winter, all the natives used Hare skin as underclothing. The men wore wide shirts or capots that hung to the knees and decorated by several rows of fringe composed of coloured moose hair and porcupine quills. The waist was girded by a broad belt embroidered or woven of porcupine

quills and dyed moose hair, and had a handsome appearance. They wore leggings and moccasins, both of which were ornamented and other decorations were worn about the neck. The head dress consisted of a narrow leather slip with bear claws attached at intervals, and eagle tail feathers fastened to the claws which would sway with the movement of the man. Both sexes had a knife in a decorated case and a pair of mittens suspended about the neck. To complete the dress, a leather blanket was worn over all. The women had basically the same clothing but wore their "gowns" much longer and more ornamented, and both sexes wore their hair 'tied up in a club on the back of the head'. (H.B. Co., Reports on Districts, Mackenzie's River, 1822-23, pp. 8-9). Doubtless the account given was from experience around Fort Simpson, where it was written, and already there is evidence of white influence in the tidiness of hair which was definitely lacking when Sir Alexander Mackenzie first went down the river (Mackenzie, 1902, p. 234). On that journey, Mackenzie found the Dogribs and Slaves dressed at all times in the clothing described, i.e., they slept in the same garb that was worn during the day. Most had the moccasins and leggings sewn together, a general practice except for some Dogribs and Hare Indians (Jenness, 1960, p. 393). Mackenzie found some men wore no breechcloth but instead a tassel "as it appears to keep off the flies, which would otherwise be very troublesome". He continues "Their ornaments consist of gorgets, bracelets for the arms and wrists, made of wood, horn, or bone, belts, garters and a kind of band to go round the head, composed of strips of leather of one inch and a half broad, embroidered with porcupine quills, and stuck round with the claws of bears or wild fowl inverted,

to which are suspended a few short thongs of the skin of the animal that resembles the ermine, in the form of a tassel. Their cinctures and garters were formed of porcupine quills woven with sinews, in a style of peculiar skill and neatness... (to which) they attach a long fringe of strings of leather, worked around with hair of various colours." (Mackenzie, 1902, p. 235-6).

The general type of clothing was universal in the region, but locally, some tribes had special modifications. The Hare Indians, for example, dressed less elaborately than the other people (Jenness, 1960, p. 394). The Mountain Indians often substituted sheep skins for moose hide in their clothing (H.B.Co., Reports on Districts, Mackenzie's River, 1826-28, p. 68). They also fashioned their shirts to come to a point before and behind, and in cold weather these were joined between the legs (Jenness, 1960, p. 397). To the north lived the Loucheux people who in their proximity to the Eskimos had a fashion not unlike their northern neighbour. "Their shirts are not cut square, but taper to a point, from the belt downwards as low as the knees, both before and behind, with a border, embellished with a short fringe... The sleeves are wide and short, but the mittens supply their deficiency, as they are long enough to reach over part of the sleeve, and are commodiously suspended by a cord from the neck. If their leggings were made with waist-bands, they might with great propriety be denominated trousers; they fasten them with a cord round the middle, so that they appear to have a sense of decency which their neighbours cannot boast. Their shoes are sewn to the leggings and decorated on every seam." (Mackenzie, 1902, p. 250). Mackenzie's description shows that the Loucheux

had the short-waisted, pointed, Eskimo-like coat and leggings which were similar to the Eskimo trousers. They did have a hood attached to the shirt, which was distinctly an Eskimo feature, but also copied and used by the Hare Indians (Jenness, 1960, pp. 394, 402). A further distinctive decoration of the Loucheux was observed by Mackenzie who reported "they use also another fringe, similar to that which has been already described, (fringe of the shirt or capot) with the addition of the stone of a grey farinaceous berry, of the size and shape of a large barley-corn: it is of brown colour and fluted, and being bored, is run on each string of the fringe; with this they decorate their shirts, by sewing it in a semi-circle on the breast and back, and crossing over both shoulders:" (Mackenzie, 1902, p. 250).

The Indians of the Mackenzie valley prepared the caribou and moose skins in two ways. During winter the shirts, leggings and robes all had the hair attached for warmth (Keith, 1890, p. 109). Caribou hair is hollow and a good insulator. With the object of getting the best skins for winter clothing, caribou hides were taken in August and September after the bot-fly grubs, hosted by the caribou, had escaped and the large holes healed over. Besides, the hair length is the best at this time of year. (Stefansson, 1951, p. 334). The hides seldom last for more than two years, for the hair sheds soon, and so there is a constant problem of renewal. Summer clothing was made of skins with the hair removed and embroidery or decoration superimposed. (Keith, 1890, p. 109). The skins were prepared by a tanning process in which the brains of the animal were mashed and used as the tanning agent. Sometimes the leather was smoked as well (Leechman, 1948, pp. 14-18).

Caribou, moose, mountain sheep and buffalo were most important beasts to the aborigines of the region, because they provided the bulk of the food and clothing requirements. Some of these animals like caribou are seasonally migratory, while others move only within a restricted range. The native Indian dependent upon them could only be guided by the activity of the animals and, therefore, Indian life was also migratory. Besides food and clothing, the need for mobility likely guided most of his conscious decisions and was the underlying reason for those unconscious habits and customs. A band or family could remain in one place only as long as the food supply within reasonable distance of the camp remained available. If a hunter did not find moose in the same country that had them last year, then his family had to move elsewhere. Although much travel was of the random, searching type, there were also predictable but seasonal journeys when the caribou moved north or south. The hunter and his family never knew a sedentary life.

Shelter

If climatic considerations were the most important in the design of clothing, mobility of the native life is reflected in the types of shelter they built, and in the extent and sophistication of their household equipment. Shelter consisted mainly of a tent or tipi which was not unlike the tipi of the plains, except it did not possess the "ears" (Jenness, 1960, p. 90). In the southern part of the region the Slaves in summer set up a pole lodge of conical shape that they covered with brush or spruce bark. The Slaves, depending as they did upon buffalo, moose and the woodland caribou, did not encounter nor follow the herds of barren ground caribou as the Dogribs did.

Consequently, few hunters were rich enough in skins to use them as covering for the lodge (ibid., p. 390); instead, the shelter was composed of wood and brush, items available anywhere they frequented. Camp could be struck quickly, and it was not necessary for these people to take any part of the lodge with them. Dogribs and Yellowknives both used skin-covered tipis partly because they possessed more skins, but also because of an adaptation to life at the edge of the forest where journeys on the barrens necessitated carrying both framework poles and cover. Bark and brush for a lodge would not be practicable on the tundra. A skin cover could be transported with reasonable ease, and it was windproof and could shed water. The Loucheux Indians used a slight variation of the skin covered hut in that they fashioned a dome rather than a cone framework and cover^{-ed} it entirely except for a hole in the middle to allow the escape of smoke. Sometimes they simply built an oblong hut of poles, brush and bark but these were used more for smoking and drying food. (ibid., p. 402).

The winter habitation generally was more substantial when the aborigines could remain at one location for an extended period of time. This was usually the case along the Mackenzie River and in the mountains to the west. Slave Indians built huts "of pieces of wood placed upon one another, the roof of which is thatched with sapin (willow brush) and the sides cemented or rather calked with moss; an aperture is left at each end to take in large trees for fuel, and another at the top to let out the smoke." (Wentzel, 1889, p. 90). Wentzel wrote this description in 1807, and there is strong doubt that the "log on log" construction is a native invention. The solid

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winter dwelling were really a more robust version of the summer pole tipis with more bark and brush to guard against wind, and to combat the cold there would be a fire in the middle with smoke escaping through a hole at the top. A rectangular form was sometimes used by the Nahanis as well as the Slaves (Jenness, 1960, p. 396). The Dogribs used their skin-covered tipis in winter as well, banking them with snow, and a fire kindled in the middle kept the inmates warm. Of all the tribes on the Mackenzie River the most backward in almost every department were the Hare Indians. Their habitations were not skin covered because they hunted rabbits more than caribou. Instead "The same poverty, nastiness and sloth distinguishes their habitations, which are generally of an oblong square form, entirely built of pieces of wood piled one upon the other until the square is about two or at the most three feet high; the wood is placed perpendicularly at the gable ends and a little higher than the sides of the hut. All this is interlaced or covered with branches and the tops of fir trees, leaving a pretty large space in the middle, the length of the roof, for the smoke, an almost unnecessary precaution as the smoke would easily find its way anywhere through the many chinks of this miserable and frail building. A hole is left at each end to creep out, and they shut up one and sometimes both in bad weather. The hut being in general no more than 8 feet in breadth, with the fire in the middle, it is hard to conceive what misery and inconvenience the inhabitants will suffer. Sometimes a couple of men and women with three or four children will heap themselves up in a diminutive hut of this description". (Keith, 1890, p. 121). The Loucheux did not travel much in the winter and therefore

had more permanent dwellings built half underground. Sometimes more than one or two families lived in such dwellings and ventured out only in fair weather to hunt caribou. (H.B.Co. Reports on Districts, Mackenzie River, 1825, p. 7). In general, however, winter shelter was essentially the same as summer, but more substantially built, and not abandoned as readily as the summer tents and lean-tos. These solid huts lasted several years, and providing they were strategically placed, they were reoccupied after modest repairs for several seasons running.

Tools and Weapons

As migrants the aborigines in the Mackenzie Region restricted the accumulation of tools and implements to those items regarded as absolutely necessary to life, and few things were given over to frivolities or gadgets that served no essential need. Also a distinction could be made between those tools and equipment which could not be fabricated quickly or easily, and, therefore, must be part of the belongings that accompanied the native on his travels, and those items which could be cut from the environment at every campsite and prepared for use with minimal effort.

Lines and Rope

Nearly all the simple activities in the native life required that one piece of an implement be fastened to its handle, or packets need lashing together, so that sewing and tying were daily occurrences. Essential above almost all other gear was the production of lines or cords. Lines were used for many things and the type of line employed varied greatly with the need for strength and the availability of material. Strong line was cut out of wet, semi-tanned moose or

caribou hide and then stretched and dried. (Osgood, 1932, p. 55). Especially long lines were cut in a spiral pattern and these could be used for snowshoe lacing or binding implements. Cut hide was known as babiche and used for jobs that required extra strength, such as pulling a toboggan, or lashing the load to it. In fact, this type of line could be employed anywhere except in water where babiche softens and stretches. For the heavier jobs it was braided into rope. Several babiche strands twisted together were used as snares for the tougher, stronger animals like bears or caribou. When it was important to have lines or cords that were pliable rather than strong, a tanning process was applied to the hides and lines could be cut from them for mitten strings, snow-shoe straps, and other light bindings. For sewing thread the tenderloin sinew from the moose and caribou was stripped out and rolled over the knee (ibid., p. 55). The Indians made strong line out of sinew by plaiting, and using it for such things as bow strings. Sometimes short lines were made of fish skin when other materials were scarce. Besides animal products used as cord, the natives employed certain vegetable sources for lines. An important source was the inner bark of willow. "The outer bark was torn off and the inner stripped from the outer while green. This was torn into strips of nearly equal width, the ends split for joining, and rolled by hand singly and then in pairs over the thigh." (Osgood, 1932, p. 55). This sort of twine was best used under water for as it dried it lost its strength. Consequently fish nets and fish lines were made of this twine. Split spruce root or "wattape" was a sewing thread used in the stitching together of birch or spruce bark for making canoes. Sometimes whole

young willow stems served binding purposes. All types of twine would be transported from campsite to campsite mainly because they were made of materials that could not be gleaned immediately from a new camp area, or they involved sufficient labour in preparation for use to make them valuable. Other tools and equipment were directed to special purposes.

Fishing Equipment

The most widely used devices for capturing fish were the willow-twine nets. The use of nets was a practice restricted to the east side of the mountains in the Mackenzie region. The Kutchin who ranged west of the Richardson Mountains and to the headwaters of the Peel River did not have nets, while those in the Lower Peel - Lower Mackenzie area used willow nets like the other natives along the 'Grand River' (Jenness, 1960, p. 401). There was great flexibility in the design of the net so that it would give rather than resist strain to the breaking point. It also seems reasonable to suggest that the mesh size varied in different areas within the region because some fish, for instance lake herring and whitefish of the Ramparts, were different in size from the lake trout and inconnu found in Great Bear Lake (see Fishes). No records have been found to show that such adaptations have been made. The length of nets were adapted to the fishing areas, with short nets in turbulent water and long nets for lakes (Mackenzie 1902, p. 237). A second common method of taking fish was by a simple willow line with a baited hook or lure at the end. Much line fishing was done in winter through the ice, when in addition to a fishing line, the natives needed an instrument to break through ice which may be four or nine

feet thick. Thus ice chisels were fashioned by sharpening the ends of moose horns and fastening them to six or seven foot spruce poles. The poles were allowed to be thick at the base to add weight to each thrust (Osgood, 1932, p. 56). The Yellowknife Indians made chisels out of native copper and some of them were traded to Dogribs and Hares. Once the hole was broken through, the water would rise in the hole and ice chips floated to the top. These were scraped out with a willow, hoop-like scoop, strung with babiche and resembling a tennis racket (Leechman, 1956, p. 209). Some adaptations were made so that the scoop became a bag with a long handle to be able to clear a deep ice hole. (Osgood, 1932, p. 57). Once the way was clear, the fisherman lowered his line and continued to keep the water from freezing with a small stick. On the end of the line would be a hook which might be fabricated from wood, bone, antler, or occasionally birds' claws. (Jenness, 1960, p. 389). Others made hooks of the jaw-bone of a trout or goose bones lashed together and baited with a piece of fish skin cut in the shape of a fish (Jones, 1872, p. 324).

Hook-and-line fishing was not practiced along the Mackenzie very much. At least toward the lower end of the river there is such a high sediment load that visibility is severely restricted for fish and men. Thus hooks and lines were not always successful. Nor was it always practicable to use spears in murky water. They were, however, a favourite instrument in lakes and clearer streams. Some spears were merely pointed and fire-hardened sticks of birch. Others were more elaborate. The Loucheux being in close contact with the Eskimos had a spear with double gaff like the Eskimos. (Jenness, 1960, p. 401). The Slave Indians made their spears as follows: "A pole

of about nine feet long with a bone blade at one end, furnished with a row of barbs, composed their spears; these bones are arranged and polished with beaver teeth..." (Wentzel, 1889, p. 91). Moose bone was a favourite material for the fabrication of spear points although other locally supplied things sufficed as well. (Osgood, 1932, p. 56). The Yellowknives and Dogribs had some copper implements. Throughout the region there was a remarkable use of horn not only for sharp points but also for other general needs. (King, 1836, Vol. 1. p. 152). Spears were used in association with dams or weirs where fish were either trapped or allowed to escape by prearranged routes and easily speared. The Loucheux Indians made fish baskets of willows, bound together by babiche. Such a basket was mounted in the water so that the fish were guided into it by converging fences, and once they enter at the bottom, the fish made their way to the top where they could be clubbed by the waiting fisherman (Jones, 1872, p. 323).

Hunting Equipment

Before the European came to this north country the most widely used method of capturing land animals was to set snares. Snares were made for the largest and fiercest animals, including moose and bears. But, they were widely used for caribou where twisted babiche was deftly set at openings in long brush fences constructed in the woods, or attached to short poles which, when the animal became caught, would be entangled in the trees during the attempted escape. Snares were also fastened to a tossing pole; a branch or young tree was bent over and secured in such a way as to be released when the animal enters the snare. The pole then sprang upright and strangled the beast. Usually this method was used for smaller game including

rabbits and lynxes. When rabbits were plentiful many could be taken this way and women often engaged in this lesser hunt. Snares were important to the economy of the natives in the Mackenzie region, important enough for a hunter's prowess to be measured by the number of his snares.

Another technique for capturing game was to devise a trap of local woods. This often took the form of a dead-fall trap. First a palisade enclosure was formed with stakes driven into the ground leaving only one entrance. Across the entrance the hunter placed a sort of stumbling-block, and another log above the entrance, with yet another large log balanced precariously above the first and held up by a slender stake. Thus it was prepared for a free drop down when the bait attached to the slender support was disturbed. In this way the large log, sometimes reinforced by heavier logs placed on top, would fall on the animal attempting to enter the centre of the enclosure to retrieve the bait. (Jones, 1872, p. 322; Ross, 1861, pp. 11-12). Such a device was adapted for large animals like bears, or the smaller ones like marten and mink. Only carnivores or those attracted by bait could be taken intentionally in this way. A variation of the wooden trap was made with a block of ice which could be propped up at one side by a frozen fish. Foxes would try to steal the fish usually with fatal results because the block would be large enough to prevent any easy escape before the ice crashed down. (Osgood, 1932, p. 60).

Sometimes Indians dug pits and camouflaged them so animals like wolves and bears would drop into the trap where they could be killed easily (Ross, 1861, p. 11). It was not always easy to construct such

a device, and it might be a reasonable assumption that pit falls were confined to the southern portion of the region where permafrost was either discontinuous or absent. Beavers were caught in nets made from babiche, but had to be dispatched quickly or else with their sharp teeth they could chew through their bonds.

Weapons

Warfare of a sort did occur in the northwest, but the weapons made by the aborigines were used more often in killing game than men. The bow and arrow are the weapons traditionally associated with Indians, and within the Mackenzie region bows and arrows showed some variation. Around Great Bear Lake bows about five feet long were made from dried willow. The centre of the bow would be about one and one-quarter inches wide and rounded like a half-round moulding. As the bows were generally straight, a guard block was fashioned and set near the handgrip to prevent the cord from lacerating the hand upon discharge of an arrow. The string to the bow was made from twisted sinew or on occasion a string of babiche. (Osgood, 1932, p. 61). Arrows were made from spruce wood as clear-grained as possible. They were usually two and one-half to three feet long and made by drawing a knife through the grain then rounded, to a thickness of between $\frac{1}{2}$ and $\frac{3}{8}$ inches. Arrows taper to both ends, but the thickest part was set forward perhaps to help balance. Three feathers two and one-half to three inches long were affixed to the end of the arrow to aid accuracy, and the point was armed with a bone, stone or even native copper point. The arrow head and feathers were lashed to the shaft with sinew. Some arrows were fixed with a blunt point to stun rather than stab, and were employed against such

game as ptarmigan or grouse. In firing the weapon, the bow was held in the left hand, palm upwards so that the bow was nearly horizontal. The arrow, with notch on the cord, was drawn with the right hand holding it between the thumb and third finger, with the thumb on top. With strength and practice an Indian could shoot accurately for a distance of 100 yards, and send arrows nearly twice that far on occasion (ibid., p. 62). Probably most of the Mackenzie natives used bows and arrows of this type. The Slave bow was also of willow, and arrows had bone points furnished with barbs. Some had flint points (Wentzel, 1889, p. 91). The Hare Indians were referred to as the Long Arrowed Indians because presumably their shafts were longer than those of their neighbours (Keith, 1890, p. 117). The Loucheux near the mouth of the Mackenzie once again showed Eskimo influence; their bow was almost identical with the Eskimo bow, and made of three separate pieces of wood lashed together by twisted sinew. (Jenness, 1960, p. 401).

Also among the weapons were spears and clubs. Spears were like those used for fishing, except they were single lances without barbs. Probably the spear represents an instrument that was not carried from place to place unless convenient, since another stick could be cut down quickly and the point hardened in fire with relative ease. Spears were used mainly to slaughter caribou caught in snares but might have been used in warfare. Clubs, likewise, could be picked up anywhere in the woods and did not form part of the travelling equipment of the Indian family. They were used on game caught in snares or traps.

Cutting Tools and Containers

Cutting tools were required in the Indian way of life to cut trees for shelter and fuel, and to cut up the game for food and clothing. It was hard to fall trees, but often enough small saplings could be broken off or dead sticks gathered for the family needs. An adze of stone was part of the equipment of the Hare Indians. "The hatchet is made of stone pointed at both ends something like a wedge, and attached to a wooden handle with a line, all of which from their frail material and construction, require infinite patience and labour to ensure them to perform their several offices. To fell timber with this hatchet they must always chop against the fil du bois and after raising a few splinters, the tree is soon knocked down". (Keith, 1890, p. 122). The Slave Indians seem to have had a more substantial tool. "Their axes were of stone shaped in the form of a pickaxe, the middle of which was scalloped in order to fit it to the end of a stick, which, when well fastened, answered the purpose of a handle, thus arranged, they could hew or rather hack down the largest tree". (Wentzel, 1889, p. 90-91). Meat was cut up with a knife probably fashioned from beaver teeth fastened to a wooden handle (Osgood, 1932, p. 58). Longer knives or daggers were made from antler and bone, or occasionally stone where suitable outcrop existed. Hare Indians used stone from the Ramparts. Both woodworking and the preparation of skins required some scrapers, and the same variety of materials served these purposes. Rock scrapers were sometimes used or the large bone from the legs of a moose was split longitudinally and the sharp edge used to scrape hides clean. (loc.cit.) Awls were required for sewing and woodwork, and were either fashioned of

leg bone or foxes' teeth. Many of the handles were specially curved to bear pressure (loc.cit.). Native copper from near Coppermine River was used for knife blades, hence the term "Yellowknife", or "Red Knife" that came to be applied to the Indians who frequented the edge of the forest to the Coppermine region. Copper, by collection and trade spread to the eastern edge of Mackenzie River. When Mackenzie arrived among the Loucheux in 1789 he found a few iron implements which had entered the region through trade with Eskimos who had made contact with the Russians along the Alaska coast. (Mackenzie, 1902, p. 249).

Apart from knives, weapons, fishing gear, lines and the like, the Indians had need of a number of containers. A variety of moose and caribou skin bags were prepared from smoked hide. A small pouch, for example, was used to carry charms, fire-making equipment and other treasures. Babies were laced into moss-bags. This device was employed in the following manner: the child was placed in the bag, surrounded by dried moss then laced in to complete the characteristic papoose of the Indians. Children spent the first year of their lives in such a bag, and were removed only to change the moss (Osgood, 1932, p. 59). Beaver fur bags were used for a similar purpose among the Nahanis. (Jenness, 1960, p. 398). A quiver for arrows was usually made of skin and slung over the shoulder. Other bags were of loosely woven or tied babiche like modern string bags which were both strong and light, and used for carrying meat or game. Some containers were necessary for the preparation of food. Indians rarely ate meat raw but cooked it either by roasting pieces on a stick before the fire or boiling it in a pot. Their primitive pots

were made of closely woven willow. "Their boilers...are made of wattape (spruce root), interlaced with willow so closely and neatly that the least sediment, with the swelling of the wood, makes it very tight. Into this vessel they put the quantity of water required, after which they heat this water almost to the boiling state with stones heated in the fire among the ashes." (Keith, 1890, p. 120). Birch bark was also used to make water-tight containers like drinking cups. Other "kitchen utensils" consisted of a spoon or two that were made from musk-ox horn which, having something of the natural shape of a spoon, could be improved by heating and shaping (Osgood, 1932, p. 60). Most of the small household utensils like dishes for food and the like were not carried from camp to camp. Instead local bark was peeled from trees, used, and discarded, thus reducing the quantity of gear which must be carried about. Eating utensils were unnecessary because food was eaten with fingers, occasionally aided by a knife.

Travel

The mobile native life required invention of ways and means to ease the burden of transporting goods necessary during the tribal or family migrations. Winter and summer travel were distinctly different and two major instruments of travel were evolved. In winter the Indian hauled things on a toboggan and walked himself on snowshoes; in summer he could move on the waterways by canoe.

Land Travel

Winter was by far the longer of the two seasons, and snow covered the ground from September through until the end of May or the beginning of June. Snowshoes were used universally in the snowy

climates except along the Arctic Coast and on the Pacific slopes. (Jenness, 1960, p. 102).

Snowshoes in the Mackenzie region had some features which distinguished them from other regions (Davidson, 1937). Generally they were long - up to 6 feet - and made from one slat of birch bent around to give a rounded front and pointed tail to the shoe. Some were made of two slats lashed together in a splice at the front which usually maintained a rounded shape but was sometimes pointed. The front end was bent upward to facilitate movement over the snow without having a tendency to dig under. As few as two cross bars were used to support the shoes, but some shoes had as many as six. These cross supports gave a natural division to the snowshoe, and when the lacing was put on, there were a toe, tail, and intermediate portions individually laced. The Indians of the Mackenzie valley made different shoes especially for right and left feet, which was not practiced widely outside the northwest. Usually the lacing formed a hexagonal pattern and was tightly woven to combat the loose snow. Mackenzie region snowshoes represented quite an advanced stage of development in this one particular item, and the care and workmanship were quite in contrast to the other characteristics of the natives of the valley, who were taken to be very primitive by the whites when they first arrived. (Davidson, 1937, p. 82; Mackenzie, 1902, p. 234).

Toboggans fashioned from long slender planks lashed side by side and turned up at the front were employed everywhere in the Mackenzie valley except by the Loucheux. Green birch wood, cut into planks was heated in the fire and then bent to form the front of the toboggan. Usually a toboggan was two or three planks wide, the planks themselves

being narrow on account of the small timber size. Loucheux Indians once again were influenced by the Eskimos and made sleds with attached runners. Two heavy wooden runners were bound together by crossbars of wood or bone, and the runners were covered with bone or frozen mud then coated with water to give good sliding surfaces (Jenness, 1960, p. 102). The Loucheux sled had the runners curved upward at both ends so that it could be drawn in either direction (Jones, 1872, p. 321). Sleds and toboggans were hauled with twisted or plaited babiche ropes, usually by the women. In pre-European days, the domesticated dogs of the Indians were never used for transportation duty. The animals were small, not much bigger than a fox, and quite useless for providing power to haul the family belongings (Jenness, 1960, p. 103). Besides, in the primitive way of life, an Indian could not hunt effectively enough to sustain dogs for winter transport. Dogs as a source of power among the natives are essentially a white man's contribution (ibid., p. 104n). The toboggans piled with family gear were hauled by the women behind the hunters who went on ahead to break trail. Snow that collects in the timbered country is not blown into a hard packed surface as it is on the tundra but remains loosely packed. Only in the spring after a melt and refreeze does the snow develop a crust. Therefore toboggans are better suited than sleds with runners to cope with light snow and even then it was usually necessary for someone to go ahead and pack down a trail. Where the woods were dense there was a tendency to use shorter toboggans so that the trek among trees could be negotiated with greater ease, because Indians armed with only crude tools avoided cutting trails, and consequently tortuous paths threaded through the woods

where stumps and trees were thick. Nor did the Indians mark their trails very well. Lopsticks, trees with all the branches removed except the crown, were common markers for caches, etc., but normally the Indians learned to observe peculiarly shaped trees, shapes and kinds of rocks, or other peculiarities of nature by which to mark their routes. Thus it is uncanny to follow an Indian over a trail, which, to the eyes of the untrained individual, is absent, and arrive at a predicted destination. The process is not unlike the one where modern man threads his way with ease through concrete jungles.

In winter as in summer Indians followed the waterways as an aid to navigation. On the big lakes where the snow may be swept clean by the wind, the traveller would find dragging a toboggan an easy task and he could probably cover long distances. Near the northern section of the Mackenzie region where the ground is less protected from wind, hard packed snow supports considerable weight and sleds are better suited to snow conditions. The Loucheux and Eskimos, through time, discovered this advantage.

Some goods, especially on short journeys, were carried in packs on the backs of individuals. Meat from the hunt was sometimes brought home this way, although toboggans were hauled to the kill too. A pack consisted of a bag made of moose or caribou skin and supported by a band of babiche, which, while packing or carrying was placed across the forward part of the skull or across the front of the shoulders. The band for support, called a tump-line, has been adapted for present use in the northwest. Of course, packing gear was not restricted to winter travel. Any movement over land in summer must necessarily be on foot and both equipment and meat had to be carried.

Women usually carried much of the load, but dogs sometimes packed small bundles. In fact, any able bodied member of the migrating unit would help. Under these circumstances it is understandable why Indians did not accumulate more paraphernalia than was absolutely necessary.

Water Travel

In summer, travel followed the waterways in the region for two reasons; canoes minimized labour of travel and transport, and waterways held a source of food in the form of fish and waterfowl. There was some variety in the forms of canoes used within the Mackenzie region. These adaptations were in response to a number of needs. Firstly, the many rapids and falls along the inland water routes necessitated the carrying of the canoe and its contents around these obstacles. Canoes, therefore, were made as light as possible. Birch bark, which is found throughout the region but is better represented in the south, was the favourite material. It could be peeled from the tree in one large sheet from a deep incision along the trunk. Thus once taken from the tree it formed a cylinder of rind compatible with the tree size. If a large canoe was desired, then the Indians had to find a large tree. A general lack of large trees in the north of the basin led the inhabitants to use spruce bark. This material was not flexible, would split easily, and in a short time became brittle. To make a canoe, the ends of the bark were pinched together and sewn with wattape to form a double-ended vessel. The centre was spread by thwarts of birch, then peeled and shaved ribs in the form of a "U" were placed at intervals to give rigidity to the craft. The operator sat on the bottom and propelled himself by means of a wooden

paddle not unlike those available commercially today. In addition to being light, it was a boat which would respond quickly to an expert's hand, and could be guided over rough water with comparative safety. Rough water which does develop on a large river like the Mackenzie, or on the Great Lakes of the region led to other modifications of the canoe. The Slave, Hare and Dogrib Indians provided protection against high waves. The Slaves made a high bow which would cut through the waves, while the other two tribes decked over the forward end of their canoes to prevent taking in water (Franklin, 1828, p. 21; Jenness, 1960, pp. 106-107). Canoes also varied in size according to the need. For travelling and moving long distance a large canoe, over 20 feet long with 4 feet beam, was constructed (Osgood, 1932, p. 50). Birch bark for such a craft had to be joined together by sewing strips side by side, with a wide strip covering the bottom. After it was fixed in place, the seams of the outer cover were sealed with spruce gum reduced to suitable consistency by mastication. Once the whole was complete, long planks were thrown in the bottom as a kind of floor to distribute the weight evenly. Indians also made smaller hunting canoes meant for one or two persons which were only 16 to 17 feet long with a $2\frac{1}{2}$ foot beam (Osgood 1932, p. 50). These light craft were used for visiting nets, hunting game birds, etc. In general the construction was the same as the larger canoe, with perhaps less care. Canoe construction took place in the spring; the women collected the bark and gum, and the men applied their woodworking skills (ibid., p. 51).

Sometimes Indians constructed crude rafts of dead and dried logs, and such crafts were used to cross streams or shore leads onto the

ice of a lake. Other types of craft occurred elsewhere in the Mackenzie region. The mountain Indians, Nahani and the Loucheux, lived in that part of the country where the streams were extremely variable in flow; spring melt of snow made most streams draining east from the Cordillera into torrential rivers. Later in the season they shrank to less fearsome water courses winding among sand and gravel islands and altogether too shallow in places for even canoes. The consequence of such river regimes was that the Indians developed a temporary boat for the short flood period. Over a crude frame of wood they stretched green animal hide - mainly moose and caribou. Generally, the journey could only be downstream, and when they arrived at a proposed destination, the frame was abandoned and the skins served as shelter covers or some other useful purpose. It is possible that those Nahani Indians who hunted along the short east-flowing streams did not bother with boats until after fur traders entered the country.

Fire-making

Fire-making is a skill peculiar to man which distinguishes him from lower animals. The Indians possessed this knowledge. Mackenzie described the equipment and methods used by Slave and Dogrib Indians. "They kindle fire, by striking together a piece of white or yellow pyrite and a flint stone, over a piece of touchwood. They are universally provided with a small bag containing these materials, so that they are in a continual state of preparation to produce fire." (Mackenzie, I, 1902, p. 239). The pyrite to produce fire was known on the Liard River as was flint stone. (Wentzel, 1889, p. 79). The Slaves in possession of such rock traded it throughout the valley.

The touchwood that caught the sparks was a punk or fungus growth found particularly on white birch and poplar trees.

Leisure Activities

Once warmed and fed, native man may have had certain periods of leisure, although it is difficult to say how much leisure the people of the Mackenzie valley had before the arrival of the Europeans. When game was scarce, much time would be required for hunting. There were, however, occasions when the larder was full and attention could be given to something other than the necessities of living. Particularly when Indians were gathered in groups about a favourite fishery or hunting place were they prone to leisure pursuits. Dancing was a joyful occupation indulged in by all from oldest to youngest. Dances varied with the occasion; some were belligerent before war, or some involved gift exchange, but most were simply dances to release excess energy and bring self gratification. (Osgood, 1932, pp. 68-9). The step was like a shuffle, with women taking smaller steps than men, and the whole moving about a central fire. It was accompanied by beats on a drum which resembled the modern tamborine but fixed with sinew snares instead of metal rattles. Mackenzie described a dance as follows, "...they amused us with dancing, which they accompanied with their voices: but neither their song or their dance possessed much variety. The men and women formed a promiscuous ring. The former have a bone dagger or piece of stick between the fingers of the right hand, which they keep extended above the head in continuous motion: the left they seldom raise so high, but work it backwards and forwards in a horizontal direction; while they leap about throwing themselves into various antic postures, to the

measure of their music, always bringing their heels close to each other at every pause. The men occasionally howl in imitation of some animal, and he who continues this violent exercise for the longest period, appears to be considered as the best performer. The women suffer their arms to hang as without power or motion."

(Mackenzie, 1902, pp. 233-34). The dancing can become quite a frenzy and some dancers drop out to be replaced by others with new variations to please the onlookers. Such amusement was enjoyed by all. (Osgood, 1932, p. 69).

Games and contests also occurred in the region. Simple guessing games as in which hand was a hidden stick, or another game similar to a ring-and-pin game, were part time activities. There was a crude dice-like game as well; children were amused by games with rattles and balls. Contest took the form of arrow-shooting, and wrestling, the latter being a method whereby disputes between individuals were settled.

THE STRONGHOLD OF THE HINDU RELIGION

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III. THE GEOGRAPHIC HARMONY DESTROYED

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Early Contacts

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 was the first to cross the height of land at North Fort, and in
 the summer of 1773 he and his voyageurs followed the course of the
 river north to a place 40 miles from Athabasca Lake (Hearne, 1773,
 p. xxv). The first to build for shelter and food passed the first of
 several winters at this place and later returned to the south.
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 collecting information from the Indians and the Hudson's Bay Company
 Fort became an important center in the Athabasca region in 1773, and

THE EUROPEAN ENTERS THE MACKENZIE REGION

Articles of European manufacture and legends about white men were known to the southern tribes in the Mackenzie region, but European man never made direct contact with the aboriginal inhabitants until 1772. Samuel Hearne, passing southward from Coppermine River on his return to Fort Prince of Wales reached and followed the east arm of Great Slave Lake. (Hearne, 1795). Thus, the Hudson's Bay Company in an early attempt to carry out the instructions of its Charter (1670) was the first to come upon a great basin well-suited to the profitable exploitation of fur resources. Subsequent independent traders from Montreal moulded themselves into a strong and vigorous trading company, and gradually occupied and developed the Mackenzie drainage basin. In this way, the North West Company seized the northern segment of a birthright belonging in law to the Hudson's Bay Company.

Early Contacts:

Peter Pond

Penetration of the region from the south came in the person of Peter Pond, some years before the North West Company was born. Pond was the first to cross the height of land at Methy Portage, and in the summer of 1778 he and his voyageurs followed Athabasca or Elk River north to a place 40 miles from Athabasca Lake. (Mackenzie, 1902, p. xxxv). The men built log shelters and Pond passed the first of several winters at this fort which later became known as The Old Establishment. Pond's House was to be a base for exploration. By collecting information from the Indians and through his own travels, Pond became quite familiar with the Athabasca region including the

lower Peace River and Slave River. He was undoubtedly the first white to visit Athabasca Lake and probably the first to see Peace River. Peter Pond's success as a traveller and ^atrader, who penetrated new fur country at a much greater distance from Montreal, the source of trade goods, than others, ~~trading areas~~ was the result of co-operation among several merchants whose combined business enterprise delivered goods to the Grand Portage at the head of Lake Superior. Thus the wintering trader, Pond, could make his exchange of furs for goods at the new depot Grand Portage, instead of having to return to Montreal. This was the pattern that sowed the seeds for a partnership which became the North West Company. In the meantime, however, competition of several groups anxiously pushed to the northwest.

After two successful trading seasons in the Athabasca country, Pond went from Grand Portage to Mackinac and then returned north again for the winter of 1781-82 (Wagner, 1955, p. 10). This time he remained at Lac la Ronge trading in opposition to Etienne Wadden. In March 1782 Wadden was shot and later died, and Peter Pond was implicated (loc. cit.) The next year Pond was at Ile-a-la-Crosse Lake, and back in the Athabasca country in the winter of 1783-84. This time he had with him a map of the northwest which gave a crude but most complete picture of the country.

Pond seems to have been in Montreal for the next winter, and in the summer of 1785 in Montreal he was cleared of implication in Wadden's death (Mackenzie, 1902, p. x1) and returned north as a partner of the newly reorganized North West Company. (Innis, 1956, p. 199) His stay in Athabasca was not without competition. John Ross and Cuthbert Grant were also on the Athabasca River and in 1786 Grant

went to Great Slave Lake to build a small post that later became known as Fort Resolution. Pond, not to be outdone, sent his man Leroux to trade in the same place (loc. cit.) The post in charge of Leroux of the North West Company, was located on the east mouth of Slave River. Its establishment was not without difficulty and loss of life. Five men drowned at the last portage on the Slave River, so this carrying place became known as Portage des Noyes (Portage of the Drowned). Leroux wintered there for one and a half successive winter seasons and had poor returns in trade with the Chipewyan nation. The English Chief (a chief of the Chipewyans) and one of Leroux's men, James Sutherland, went out to the Indian bands, and as they tried to improve trade they gained some idea of the country surrounding the lake (Wentzel, 1889, p. 94). Pond, of course, would receive this information and add it to his map. He now knew of the great river which flowed west from Great Slave Lake and conjectured on it being the long-sought route to the Pacific Ocean. The complete grasp of the geography of the northwestern part of North America which Peter Pond possessed shows through the schemes he proposed for the course of commercial operations in the area. He knew Russian activity on the northwest coast was not too far distant; he knew of American plans to compete with the Russians in the same area; and he felt that it only remained for the North West Company to find the route to Cook's River and have this entire trade supplied by ocean traffic.

During the winter of 1786-7, some of Pond's men were in a scuffle with men from the rival trading post, and John Ross, Pond's opposing trader, was killed (McKenzie, 1889, p. 18). Such a fatal outcome of

strong rivalry led to the coalition of interests in the summer of 1787 and the Athabasca trade was once more exclusively in the hands of a new North West Company. (Innis, 1956, p. 200). Alexander Mackenzie at the age of twenty-four was now a partner of the Company. He was sent to winter with Pond who, the next summer, had to travel to Montreal to give evidence concerning Ross's death. Thus for one winter Mackenzie was to be with Pond and share his knowledge of the northwest while working on his map. By this time Pond knew much of the local region from native reports and also from visiting his sub-posts on Great Slave Lake and in the lower Peace River country. He knew, and Mackenzie was to learn, that the Peace River drained from the Rocky Mountains, and beyond them to the westward were streams descending to the Great Salt Lake. Also on Pond's map was the Grand River outlet of Great Slave Lake leading westward, and therefore it must surely connect with Cook's River and the Pacific. The map showed the source of the river and a plausible mouth at no great distance from one another. Logically this was the river which must next be followed before the route across the continent would be found. Probably the implications and prospect of reaching the Pacific was also shared with Mackenzie. Ever since the Russian explorers reached America in 1741, the Russian fur traders had been busy on the west coast (Mirsky, 1948, pp. 77ff). Rich furs of Alaska seal and sea otter were harvested in quantity and marketed close by in China. American ships trading on the west coast tapped and drained Indian loyalties from the interior. The trader from Canada wished to forestall both these nationals. Pond envisioned a port on the coast which would supply the Athabasca trade at less cost and with less toil than

the present route across Canada. It would also forestall Russian and American expansion and give a base for the lucrative China trade. Legally, the North West Company was barred from the Pacific by the South Sea Company's monopoly and from China by that of the East India Company. It is also true to say that they were legally barred from the interior of Canada by the monopoly of the Hudson's Bay Company.

The Main Penetration:

The North West Company and Mackenzie.

A winter of travelling Pond's domain, listening to his schemes and seeing the progress of his map probably did much to change Alexander Mackenzie from fur trader to explorer. Neither role would have been possible without his other essential qualities. Mackenzie was born at Stornoway on the Scottish Island of Lewis in 1763. (Woolacott, 1927, p. 19). It is said he received a "fair" education and he must have been used to rugged outdoors, the sea and boats. He arrived in Montreal in 1779 to begin his apprenticeship with Gregory and McLeod in their counting house. For five years Mackenzie learned the mechanics of fur trading before going at the age of 22 years to Detroit as a trader in the company of Peter Pangman. During the winter 1785-86 he was elevated to the rank of bourgeois trading on the Churchill River opposite the North West Company man Patrick Small. This brief experience seemed enough to convince the partners of a reorganized North West Company, that their new man, Alexander Mackenzie, was capable of trading in the Athabasca territory. He was sent that summer of 1787 to join Peter Pond.

After one winter together there can be no doubt that both men had agreed that Mackenzie should be the one to explore the river leaving Great Slave Lake. Pond was now no longer a young man for he

was nearly fifty years (Wagner, 1955, p. 3), and besides he had to travel east the next summer because of Ross's death. As the summer of 1789 approached Mackenzie realized he could not explore the river without the help of his cousin Roderic McKenzie. The latter had planned to take leave from the northwest on furlough. He was, however, persuaded to remain another year saying in his journal "He (Alexander) informed me in confidence that he had determined on undertaking a voyage of discovery the ensuing spring by the water communications reported to lead from Slave Lake to the Northern Ocean, adding that if I could not return and take charge of his department in his absence, he must abandon his intention. Considering his regret at my refusal and the importance of the object he had in view, I, without hesitation, yielded to his wishes, immediately set to work and accompanied him into Athabasca." (McKenzie, 1889, p. 27). In his correspondence with his cousin, Alexander Mackenzie asked Roderic to keep his intentions a secret for fear that the Montreal partners might try to interfere with the plan on the grounds that he was neglecting the business of the company. To forestall any such accusation, Mackenzie also had plans to promote the fur trade in his department. A new post was to be built on Lake Athabasca and while he remained at Pond's "Old Establishment" Roderic travelled down to the lake determined to build the new fort before the winter began. This post, called Fort Chipewyan, was located on the south side of the lake some eight miles east of the Athabasca River mouth. The fort was to be built to show the natives that the Company was interested in being closer to their hunting grounds and it would become the main depot for strengthening the hold on the region discovered by Pond.

The show of sure and certain intention on the part of the North West Company was not any too soon. Prodded by the increased competition, the Hudson's Bay Company turned its eyes toward the Athabasca region. In 1781 Robert Longmoor (H.B. Co., B. 239. b.42, pl. 4) intended to travel from Cumberland to Athabasca in preparation for extending trade. However, smallpox raging on the Saskatchewan prevented the journey. At about this time, too, the British Government held renewed interest in searching for a route through North America to the north Pacific. There was some consort between the government and the Hudson's Bay Company in pursuit of this goal. However, it came to nought, and instead Philip Turnor, a surveyor in the employ of the "English" set out in 1790 for the Athabasca country. He was accompanied by an assistant, Peter Fidler, and the whole expedition was under the command of Malcolm Ross. Turnor and Fidler proceeded to Athabasca from Ile-a-la-Crosse where they had wintered, and arrived at the new Fort Chipewyan in August 1791. He knew already of Alexander Mackenzie's journey to the northern sea having met the explorers in June (McKenzie, 1890, p. 37). Once again the North West Company had been there first. Turnor's visit was not unheralded. It appears that the Northwesters had been asked to co-operate with the surveyor, and although he was a man from the Hudson's Bay Company, Turnor was treated hospitably. In return he was able to give the correct location of Fort Chipewyan to Roderic McKenzie in charge. At that time, there was some concern that the new Athabasca posts might be near the 49th parallel separating the new United States of America from British territory. Turnor was able to satisfy this anxiety only to create some disappointment. Instead of being close to the Pacific Ocean as

had been the hope of both Pond and Mackenzie, the new fort was at only 115° of west longitude, still 35° away from Cook's River.

Alexander Mackenzie, during the winter of 1788-89, had journeyed to the new Fort presumably to prepare for the voyage down La Grande Riviere. He also arranged for a summer of trading on the far side of Great Slave Lake. As the Winter Express (dog team carrying letters to Grand Portage) set out for the south in February, Mackenzie returned to the "Old Establishment" to pass the remainder of the winter and complete the spring trade after break-up of the rivers. The business of the department was completed hastily, for by June 3rd, 1789 he had prepared his expedition and departed. Mackenzie's clerk, Laurent Leroux accompanied him across the familiar route to Great Slave Lake and after delay by ice on that lake, the group was able to move to the north side and into the North Arm. They remained for some time in the vicinity of Yellowknife Bay where Leroux had been previously. Here the explorer first met the "Red" or "Yellow" Knives that hunted north of the lake and were known for their copper implements. It was intended that Leroux stay to encourage their trade after Mackenzie's departure. He did this by moving to the extremity of the North Arm and proceeding to Lac La Martre. This new post was 15 days march nearer to the homes of the natives who traded formerly at the Lake (Wentzel, 1889, p. 95). In this way the Northwesters were able to consolidate the hold on natives that once travelled in the depths of winter with their furs across the edges of the barrens to Hudson's Bay posts.

Mackenzie's journey in the summer of 1789 extended over one hundred and two days. During that time he experienced hardship and

disappointment. It appeared that the new river led only to the frozen ocean through a land that was sparsely populated by backward people, many of whom were unfriendly. The northern portion of the valley did not seem valuable with respect to the trade. Indeed, the river was the River of Disappointment. The winter of 1789-90 must have been a hard one, not only for the scarcity of provisions but Mackenzie had to live with the image of failure. Probably intelligence from his trader, Boyer, on the Peace River turned Mackenzie's mind in that direction as the means to redress the disappointment of the last journey. Perhaps this was the way to the Pacific Ocean. Harboursing these notions, Mackenzie left the Athabasca country for the east and a visit to England.

The Discovery of the Mackenzie River : Mackenzie's Voyage

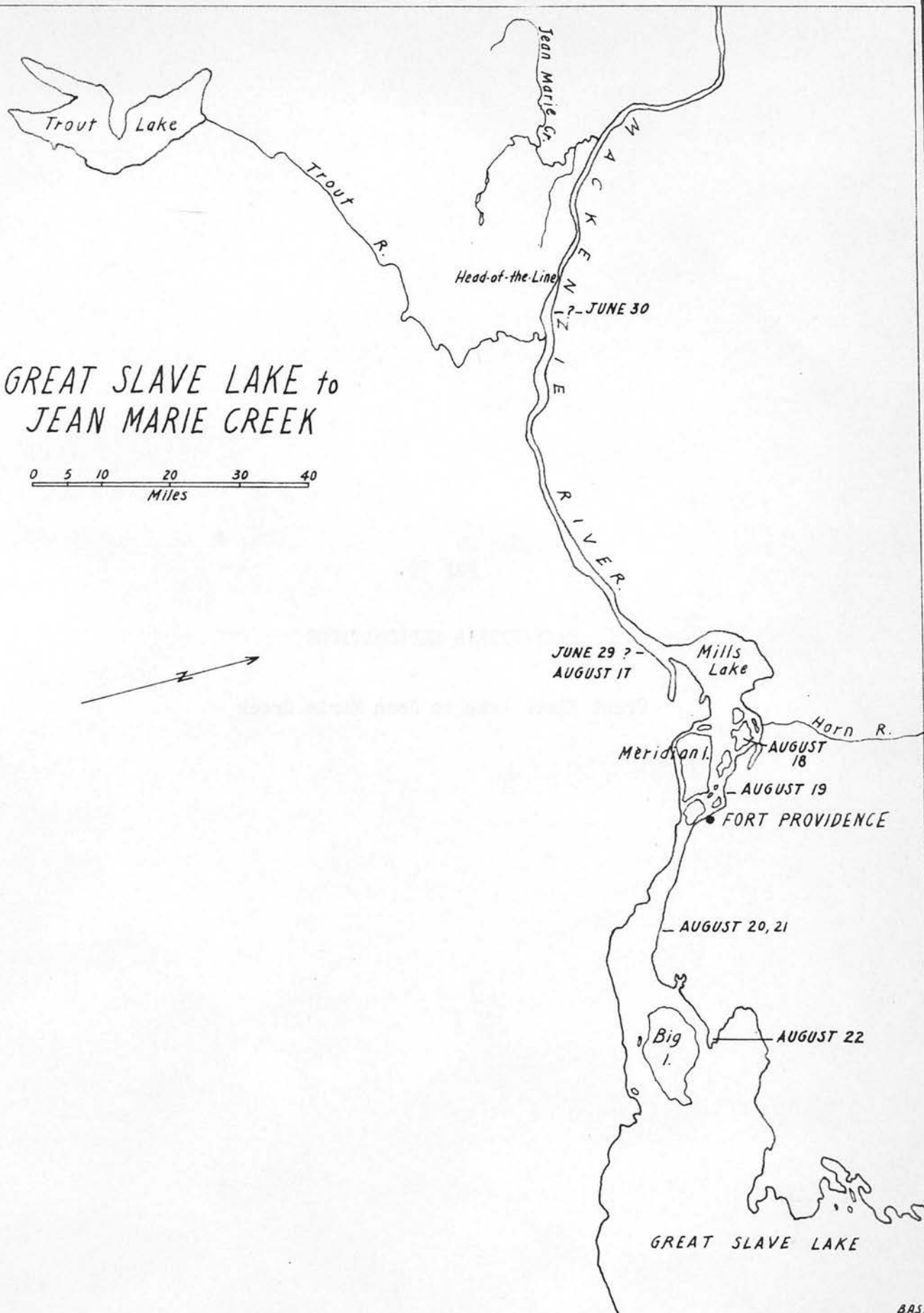
Down North

Alexander Mackenzie first entered the river which bears his name at half past five in the morning of Monday, 29 June 1789, (Mackenzie, 1902, p.220). He "found it to be the branch or passage that was the North Channel and one of the two outlets draining Great Slave Lake." Although Mackenzie describes it as "about a half a mile across", this river is nearly one mile wide at the entrance (Hydrographic Service, 1958, p.32). There is no doubt that North Channel was Mackenzie's route because he was approaching along the north side of the lake, where the main entrance to the river tapers from an overall width of 20 miles to a passage two miles across (loc. cit.) In the passage are many islands which are not talked of in the narrative. Nor is there any mention by Mackenzie of difficulty passing through this shallow and boulder-strewn channel since at the time of his traverse the water level would be high from spring melt, and the stiff breeze blowing from the east would have the effect of piling water up at the western end of the lake. (Mackenzie 1902, p.221).

Mackenzie was reassured that he had found the main outlet of Great Slave Lake when he passed the west end of Big Island and, crossed the wide portion of the river known as Beaver Lake. He speculated that the channel must be much narrower at time of low water for his soundings were between two and five fathoms. An east wind and strong current, probably more than three m.p.h. (Hydrographic Service, 1958, p.33), quickened the passage around the islands in the vicinity of present Fort Providence. In keeping

GREAT SLAVE LAKE to JEAN MARIE CREEK

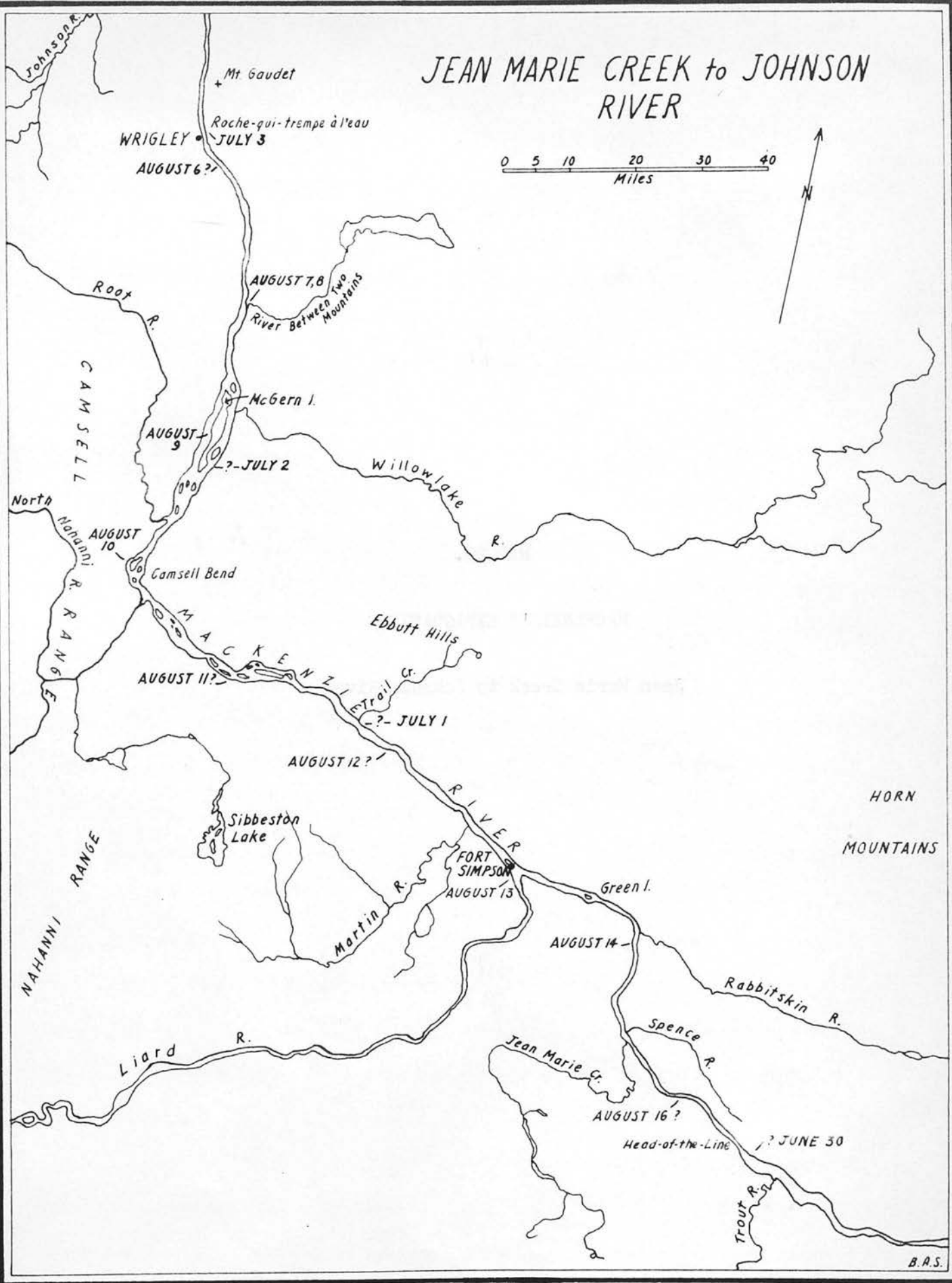
0 5 10 20 30 40
Miles



to the main river on the north around Meridian Island, the explorer observed the southern channel where a slower current promised a better upstream route for his return. Where the river widens into Mills Lake the current slackens and the men resorted once again to using paddles, keeping all the time to the north side. The Copper Indian guide from Great Slave Lake mentioned as they passed the mouth of Horn River that this stream flowed from the flat-topped mountain in view to the north. Off the delta of this stream they entered Mills Lake but soon found the water too shallow for canoes, and were forced to turn southwest to reach deep water and the outlet of the Lake. Soon after sunset they camped. The campsite is not identifiable, but it seems probable they chose the south side of the main stream as it leaves Mills Lake where the shore is not flanked by shallow, weed-covered approaches like the north side of the river. Since entering the Mackenzie River, the account indicates a passage of some 63 miles. However, following the journal with modern maps suggests instead that this long day took them about 75 miles.

Tuesday, June 30, 1789. Mackenzie resumed travel at four o'clock in the morning. The low clay and gravel banks supported dense spruce forest with many large swampy patches. The two m.p.h. current below Mills Lake hastened the downstream journey for soon they were able to see "on the south side of the river - a ridge of low mountains, running East and West by compass. We proceeded south-west by south six miles and then came to a bay on our left which is full of small islands and appeared to be the entrance of a river from the South. Here the ridge of mountains terminates."

JEAN MARIE CREEK to JOHNSON RIVER



of the journey on the Mackenzie River brought the explorer past the Trout River tributary to a campsite a few miles beyond. As the channel has many of its shallows on the south side one could speculate that Mackenzie followed the north shore, in which case he may have camped on the north shore, where the banks are slightly lower.

Wednesday, July 1, 1789. A short time after departure at half past four in the morning the canoes came to the narrowing of the river called later Head-of-the-Line. The river becomes less than one half mile wide and the current increases. Mackenzie remarks on the high banks but notes they are not perpendicular. Throughout this confined stretch some 60 miles long, the river never becomes much more than a mile wide, and is flanked by high gravel banks which are up to 60 feet from the water on the south side, but are of the order of 20 feet to 40 feet high on the north side. A fast current, five to seven m.p.h., carried them along swiftly and few topographic features were to be observed throughout this passage between banks that restricted the view. However, the account does mention a river "on the south-east side" (ibid., p.224). In the general locality where this observation must have been made, the Mackenzie River follows a northwest course or a west-northwest course by compass as the journal states. Although directions are confused, there is no doubt that the tributary river joined the main river from the south and upon examination of the present map the stream mentioned must be either Jean-Marie Creek or Spence River. The former seems the most likely candidate for its mouth is the larger of the two and must have been very

evident during the passage downstream. The other stream, Spence River, enters Mackenzie River by a divided mouth one of which when viewed from the main river would seem to flow from a south-east compass direction. It is possible that this is the information Mackenzie's journal wished to communicate.

In the portion of the river that flows almost due north, the party lost the lead from the sounding line and while trying to retrieve it found that they could not paddle against the current with eight men paddling plus the strength of the line estimated to be worth an additional 4 paddles. As they continued north, Mackenzie says he "saw a high mountain, bearing South from us" (loc. cit.). This is a mystery for no mountains would be visible from the river. Even peaks which reach 5000 feet in the Liard Range one hundred or more miles to the southwest are not visible. The highpoints of the upland east of Sibbeston Lake and west of Fort Simpson rise to 2700 feet above the sea or 2200 feet above the point on the river from which Mackenzie was observing. Perhaps these hills could be seen clearly if atmospheric conditions permitted, but they were to the west of the explorer rather than to the south. The only remaining possibility would be a projection of the southern skyline where the land rises towards the plateau surrounding Trout Lake and farther east. It is hard to see why this upland should have been called a mountain in comparison with Horn Mountain that is clearly visible and is a prominent block when viewed from the same location.

The continued journey took Mackenzie past the mouth of a small river entering the north side of the main stream nearly at

the point where it turns to follow in a west-northwest compass course. This was the mouth of the Rabbitskin River that drains a number of lakes near Mills Lake and the southern flanks of Horn Mountain, and enters the Mackenzie over a shallow bar composed of boulders and gravel (Hydrographic Service, 1958, p.39). Along the stretch to the westward the Mackenzie River is bordered by banks of increasing height some of which have exposed mud and gravel while others are carpeted by spruce and poplar trees. The party must have moved along easily and quickly aided by the current which runs from three to six m.p.h. Boulder-covered shallows jut out into the main stream from both sides of the river, and in notably constricted courses like Green Rapids between Green Island and Hanson Island the passage must have been swift. Mackenzie says they "landed upon a small island where there were the poles of four lodges standing, which we concluded to have belonged to the Knisteneaux, on their war excursions, six or seven years ago. This course was -- to where the river of the mountain falls in from the Southward" (Mackenzie, 1902, p.225). It is likely that the island described was Marten Island which is the only island in the Mackenzie River east of its confluence with the Liard, or River of the Mountains, from which the joining of the two rivers could be observed. Had Mackenzie climbed the cutbanks of the island which are over 50 feet high, he would have had an excellent view of the mouth of the largest tributary to enter his river. He may well have climbed the bank but he describes the scene simply by saying "it appears to be a very large river, whose mouth is half a mile broad" (loc. cit.). Nor was there mention of the striking

phenomenon of the water of the Mackenzie flowing clean and clear alongside that of the Liard which is charged with sediment; a feature of the river which is distinguishable from some 150 miles downstream. Six miles beyond this junction a small river was seen to enter from the south side. This would be Martin River which is more like 10 miles from their former observation point, but distances must have been difficult to estimate especially as the current of Mackenzie River quickens to about four m.p.h. below the mouth of Liard River (Hydrographic Service, 1958, p.43).

By Mackenzie's reckoning, their evening camp was about 24 miles from the Liard River. They "landed opposite to an island, the mountains to the Southward being in sight" (Mackenzie, 1902, p.225). On this island they cached some of their pemmican to relieve the heavily laden boats.

It has been noted already that Mackenzie's estimates of distances were often in error and usually on the conservative side. The mistake is certainly excusable. Accordingly, his cache island might well have been farther downstream and one of the two islands just upstream from Trail Creek draining from Ebbutt Hills. It is possible too that he landed on the north side of the river where the banks are low gravel and sand in preference to the higher approaches of the south shore. Throughout the day the explorer had travelled by his own account some 66 miles; probably the distance was 100 miles. This seems a considerable distance, but taking into account the river current and the long days that Mackenzie worked, it is not at all impossible. By drift alone without energetic paddling, the whole of this journey

might have been accomplished in about 20 hours, with an average current of 5 m.p.h., which is not unreasonable when much of the route was through narrow portions of the river below Head-of-the-Line where currents reach seven m.p.h. (Hydrographic Service, 1958, p.38). If Mackenzie's crew could paddle an additional three m.p.h. then the whole of the day's passage could have been done in twelve and a half hours without stopping.

The mountains to the south (compass bearing) were probably the upland masses surrounding Sibbeston Lake which is enclosed by rounded summits, some of which are over 2000 feet above sea level. These may be the same mountains referred to by Mackenzie earlier in the day.

Thursday July 2, 1789. It was foggy when the group left their encampment at half-past five, but it had cleared at seven o'clock. This permitted the discovery that the river water was now dark and muddy as compared with the clear stream they had travelled previously. Since the clear Mackenzie and muddy Liard waters maintain separate identity for a considerable distance downstream of their junction, it seems likely that the explorer had wandered in the fog to the south-west side of the main river. The muddy water "must have proceeded from the influx of some river to the Southward, but where these streams first blended their waters the fog prevented us from observing" (Mackenzie, 1902, p.226). There appears to be no recognition that the Liard, or River of the Mountains, was responsible for the change, and would also indicate that the travellers could not have seen from

the low angle of observation in his canoe, the change of colour as he passed the mouth of that great river.

The current flows up to six m.p.h. through the stretch of the river where Mackenzie found himself on the morning of July 2, 1789, and with the aid of paddles the party travelled some 20 miles by nine o'clock. "At nine we perceived a very high mountain ahead, which appeared, on our nearer approach, to be rather a cluster of mountains, stretching as far as our view could reach to the Southward, and whose tops were lost in the clouds." (loc. cit) This was the first glimpse Mackenzie had of the Franklin Mountains which are the eastern ramparts of the Northern Cordillera. It was also the first time he had seen the mountain ranges of Western North America which were to be the great barriers to progress towards the western sea. Without doubt, the range of mountains observed was the North end of the Nahanni Range and the first mountain observed was possibly Nahanni Mountain (3,990 feet). Other peaks to the south may be a matter of a few hundred feet higher, but because of greater distance from the river, they could be seen only on closer approach. These must have been the cluster of mountains mentioned in the narrative. The mountains with part of the summits shrouded in cloud would come on the horizon at 25 miles distance. At this point Mackenzie was probably travelling on the south side of several large islands and next to the banks which, decreasing in height downstream from his previous encampment, become low and expose the rolling country southward to a better view of the land beyond.

They approached the mountain front in a thunderstorm and saw the slopes covered with forest above which barren peaks were visible. White patches, at first were presumed to be bedrock, but the return journey proved them to be snow accumulations that had disappeared during the summer.

Nearing the mountains, the explorer proceeded with caution for he expected to meet a waterfall or rapid. Although it is not mentioned in the journal, the increasing number of islands, the rocky bank of the south shore, and the mountains themselves could all have contributed to the uneasy feeling that the course of the river was about to cascade over or through some topographic barrier. "This was such a prevalent idea, that all of us were occasionally persuaded that we heard those sounds which betokened a fall of water." (*ibid.*, p.227).

An abrupt change of the river course from west by north "to north by west along the mountains" (*loc. cit.*) indicates the rounding of Camsell Bend but Mackenzie made no report of the mouth of the North Nahanni River which joins the main river a few miles upstream from the Bend. This river mouth opens around several small islands and is one of variable flow. Possibly this fact, coupled with the overlapping appearance of the Nahanni Mountains with the South end of Camsell Range might have disguised the fact that a tributary was present. Besides the Mackenzie is a mile or so wide at this confluence and the Nahanni River may not have been evident at river level if topography did not reveal the cleft in the mountains.

As the group pushed down the river they observed several

native encampments of varying ages, but no people presented themselves along the shore. There was a beaver killed and as the first one seen on the journey, it must have been a good omen for future trade in the area. The passage beyond Camsell Bend led among many islands and it is possible that Mackenzie kept along the right bank as he makes no mention of another mountain tributary, Root River, entering from the west which he must have passed. The land along both banks is low and the mountains to the west dominate the scene in that direction. To the east, the rolling, hilly surface gradually emerges as a ridge increasing in height to the north. By Mackenzie's estimation they travelled 21 miles from the Bend before landing for the night on the north or right bank at eight o'clock. As no other evidence concerning this encampment is recorded, it is difficult to locate the exact portion of the river he reached. However, if he had kept to the right side of the stream, he should have passed along the east side of McGern Island, which is over 14 miles long, a hundred feet high and which divides the Mackenzie into two channels. It is probable that the encampment was in the vicinity of the southern end of McGern Island slightly more than 21 miles from Camsell Bend, yet upstream from the entrance to Willowlake River, because Mackenzie certainly would have mentioned this tributary had he passed its mouth. There is the possibility that the explorer may have taken the left fork of the river and passed along the west side of McGern Island, in which case the Willowlake River mouth could not have been seen, but it is unlikely that the island, large as it is, would have

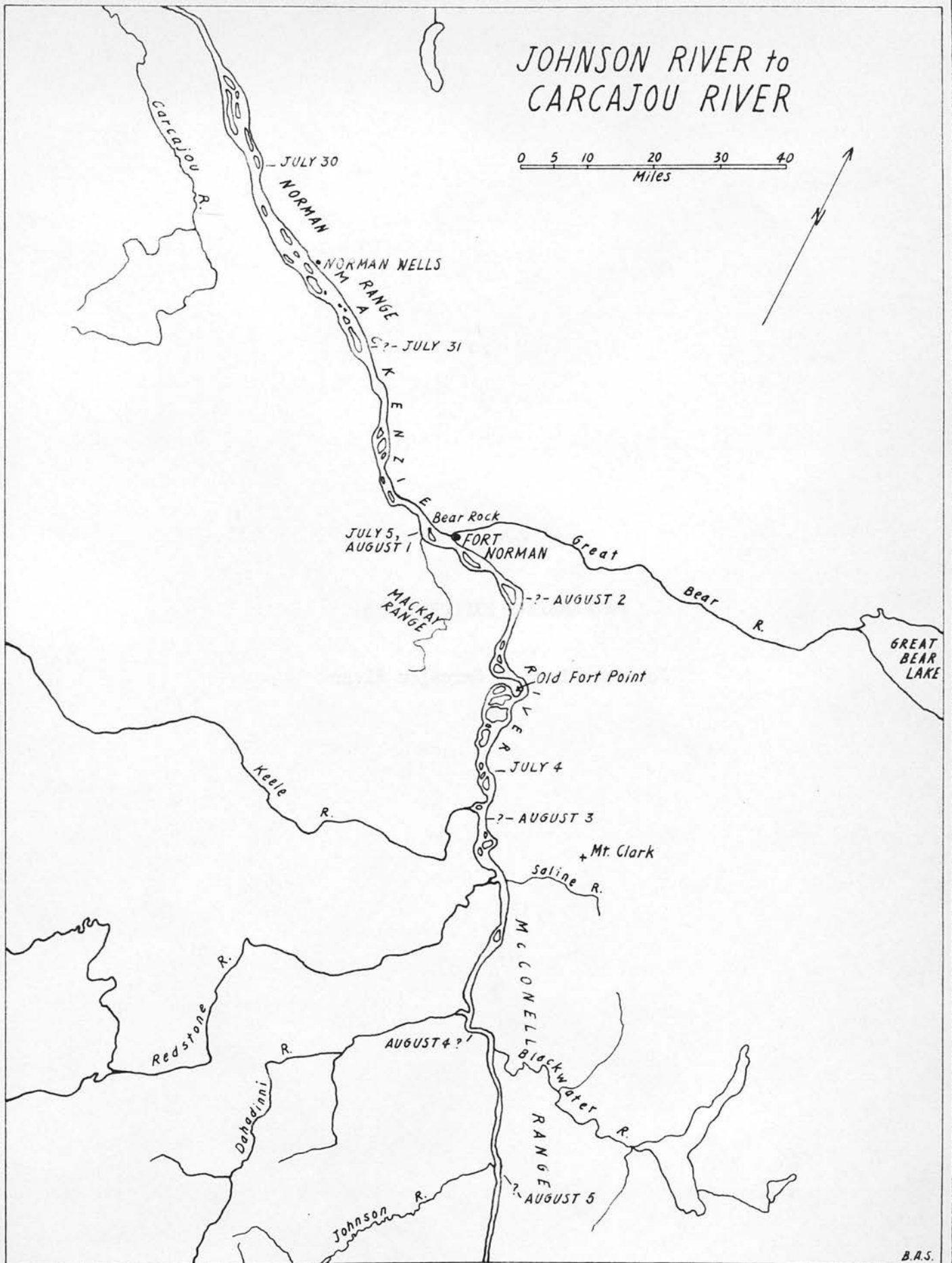
been mistaken for the mainland. Whatever the actual course of Mackenzie, the general location of his camp should have been on or across from McGern Island. The estimated total distance of the day's travel in the account is 63 miles. In fact the distance was probably around 70 to 75 miles. This closer agreement of the journal distance to the true distance is consistent with a slower average current of three m.p.h. (Hydrographic Service, 1958, p.43) throughout this whole stretch, which is manifest in part, by an increase in the number of islands and shoals that present many navigational problems.

Friday, July 3, 1789. The rain which had continued throughout the night subsided enough to allow Mackenzie and company to depart their camp about seven in the morning. During the first part of the morning, the party should have passed the entrance of Willowlake River because the course of the Mackenzie is described as "being enclosed by high mountains on either side." (Mackenzie, 1902, p.227). The range inland from the west bank is the Camsell Range, and on the east bank north of Willowlake River gradually rising land becomes distinctly mountainous forming the southern end of the McConnell Range of the Franklin chain. Why was there no mention of Willowlake River entering from the east and 300 yards wide at the mouth? It has already been suggested that Mackenzie may have passed this point on the west side of McGern Island, thus preventing the observation of the river mouth. Another possibility to consider is the weather, "a strong headwind, and the rain was so violent as to compel us to land at ten o'clock" (loc. cit.). The rain and wind could have reduced

visibility to the point where the river mouth might pass unseen, or the attention and work required to fight forward against the elements may have left little time for observation. When the journey continued after the storm Mackenzie found soon "a river fell in from the North, and in a short time the current became strong and rapid, running with great rapidity among the rocky islands, which were the first we had seen in this river" (ibid., p. 228). A further description of the river reports "the current has been so strong that it was at length, in an actual ebullition and produced a hissing noise like a kettle of water in a moderate state of boiling" (loc. cit.) A few miles downstream from the place where River-between-Two-Mountains joins the Mackenzie from the east, the main course narrows, being confined between banks at first up to 400 feet high and lowering downstream to 100 feet in height. All the way the banks are steep and wooded confining the river and causing it to increase speed and give the seething effect reported in the journal. This stretch is now known as Little Rapids. Along the route Mackenzie passed several native encampments, but saw no people and concluded that these camps were not recent. They "encamped at eight in the evening at the foot of a high hill, on the North Shore which in some parts rose perpendicular from the river. I immediately ascended it ... and in about an hour and a half, with very hard walking ... gained the summit ... The prospect from this height was not so extensive as expected, as it was terminated by a circular range of hills, of the same elevation as that on which we stood. The intervals between the hills were covered with small lakes ..." (loc.cit.)

JOHNSON RIVER to CARCAJOU RIVER

0 5 10 20 30 40
Miles



It is without doubt that this campsite was at the foot of Roche-qui-trempe-à-l'eau. The rock face rises sheer from the water side, and in order to climb it, one must move up the flank. It is possible that Mackenzie climbed this rock and even crossed a small dip in the mountain top to reach the highest summit by the river, Mount Gaudet about 1,500 feet. From this point the view to the eastward would be terminated by the line of peaks of the main portion of the McConnell Range of Franklin Mountains. Although they are higher than the peak upon which Mackenzie stood, their distance away from the river, about 12 miles or more, may have created the impression of a similar height and would most certainly have prevented observation beyond these summits. Indeed the intervening land is dotted with many lakes (M.Y. Williams personal communication).

The explorer was surprised to find this high point had an Indian encampment upon it. His native companions explained that the local people were in the habit of using such a situation as a defence against marauding Cree from the south who, now in possession of firearms, were extending their hunting ground to satisfy trading needs.

The day's journey was claimed to be 45 miles by Mackenzie but it seems that the actual distance they had covered was about 52 miles.

Saturday, July 4, 1789. Wind and rain continued on this day but did not prevent the resumption of the journey downstream. The passage was mostly between high banks 150-300 feet on either side, somewhat steeply inclined and wooded, at other times exposing bare

slopes with undercut portions. The current of the Mackenzie runs about four m.p.h. on the average below Wrigley or Roch-qui-trempe-a-l'eau and throughout the river is relatively straight and seldom over a mile wide. The passage northward was direct and swift. This hurried section of the journey is reflected in the sparse observations recorded for the day. Mackenzie notes the confluence of Blackwater River, draining through the mountains from the lake of the same name east beyond the mountain front. He mentions the entrance of Dahadinni River draining the edge of Mackenzie Mountains in the west. Farther down, Redstone River from the west and Saline River from the east both empty their water into Mackenzie River opposite one another some 445 miles from the source of the major stream. Here Mackenzie viewed "a mountain ahead, fifteen miles" (Mackenzie, 1902 p.228) which was likely Mount Clark, 4,798 feet, the only individual peak or prominence in the vicinity and lying in the McConnell Range about fifteen miles east of the river from which Mackenzie observed it. Downstream from Blackwater River the Mackenzie seems deep and strong, once again seething in its downstream drive between six to eight m.p.h. The party camped at eight p.m. on an island, possibly the first or second very large island downstream 10 miles or more from the mouth of Keele River. The whole day's journey was a long one even by Mackenzie's standards. He gives the passage as 70 miles, but measured on the map it was probably a journey of 105 miles. Once again the discrepancies between the estimated and actual distances are great and awkward to explain, especially when on other days the distances agree more closely. In defense of Mackenzie's estimates,

it can be said that the variable current experienced during the day may have deceived the explorer.

Sunday, July 5, 1789. The sun had been below the horizon exactly four hours when it rose seven minutes before two in the morning allowing Mackenzie's party to continue the adventure down to the river mouth. The passage leads between low clay banks to the west and steep, scarped banks rising to 300 feet on the east. They passed Old Fort Point where later a post was erected for trade; a few miles beyond the river widens and the current slackens to three or four m.p.h. Here the journal reports that Mackenzie could see "a ridge of high mountains before us, covered with snow" (*ibid.*, p.230). It is hard to know precisely what mountains had been observed for the view in all directions would reveal mountains. One range, Mackay range, some 15 miles west of the river where Mackenzie was, stands as a definite ridge and probably in July remained partly snow covered.

But the next day in the journal Mackenzie refers once again to "the ridge of snowy mountains always in sight" (*ibid.*, p.240). If this is the same ridge of the previous day it would seem possible that the initial observation was the edge of the Mackenzie Mountains away to the west. These mountains, with peaks rising about 5,000 feet must have formed the western horizon and appeared as a snowy ridge visible for many miles of the journey downstream.

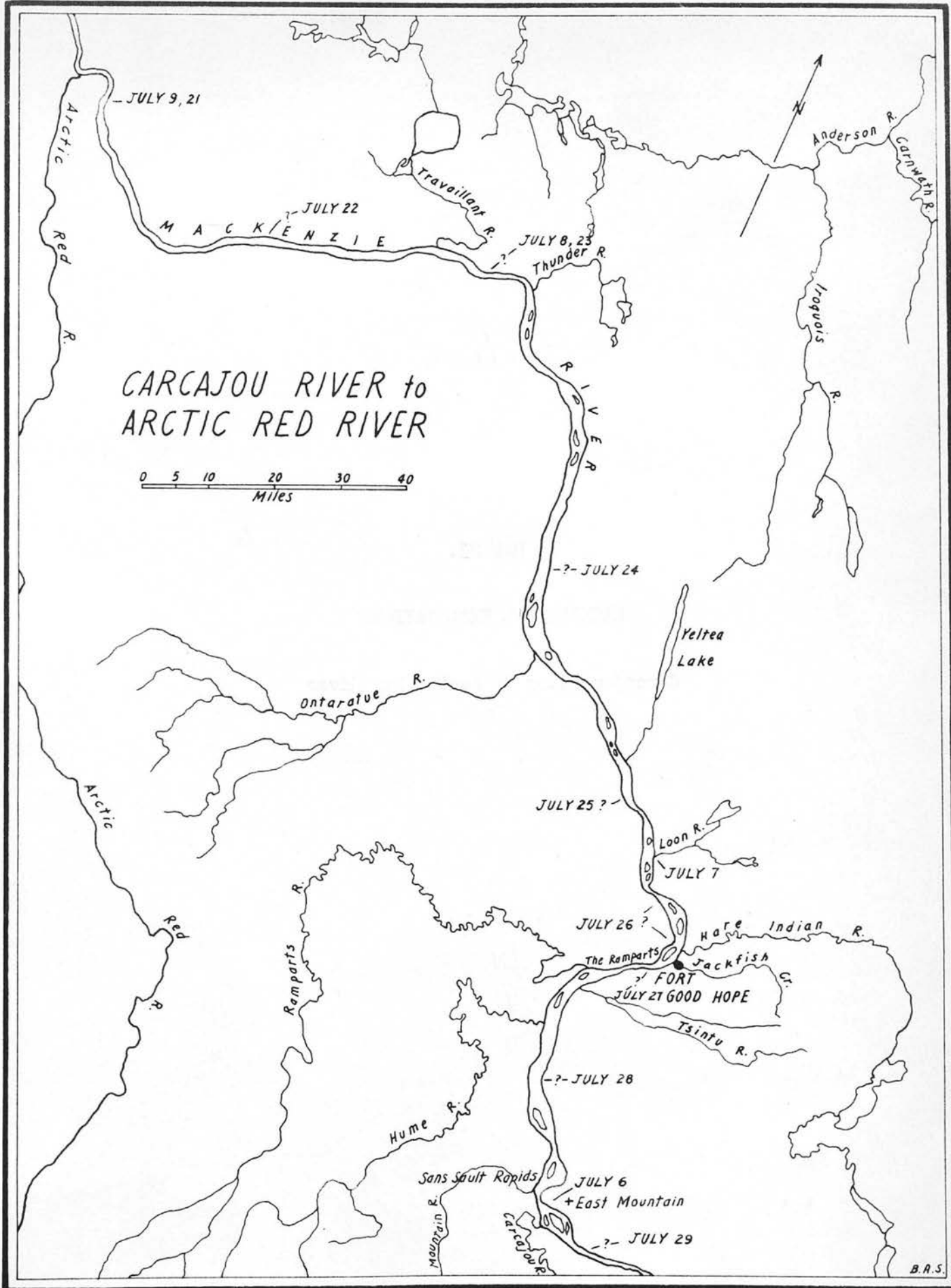
The remainder of the day's travel took Mackenzie past the mouth of Great Bear River which he noted was deep and about 100 yards wide. He observed and recorded that the water was a clear,

sea-green in contrast to the Mackenzie's muddy flow. That night strong wind and rain forced the party to land and camp somewhere beyond Bear Rock (1,488 feet) probably on the north bank. This is the same peak described by Franklin, coming later, that rises abruptly from the water and leads on to the southern end of the Norman Range in the Franklin Mountains. The local natives believed a storm to be continually present on the summit. The total travel for the day was estimated to be only about 25 miles. In fact they probably covered nearly 50 miles, not a long distance by the standards set on previous days.

The reason for the lack of spectacular distance was because the party made their first contact with Mackenzie Valley natives. Somewhere upstream from Great Bear River on the north shore he "saw several smokes" and "made every exertion to approach" (ibid., p.230). The strangers took the natives by surprise and they were unable to escape into the woods or by canoe. Mackenzie's party kept discrete distance, pitched their tents, and all the time in the Chipewyan language assured the group of peaceful intentions. Shortly, terror and confusion gave way to calm and it was apparent that the language of the English Chief, a native from far off Athabasca, was intelligible even at this great distance. The Indians were of two tribes, Slave and Dogrib, about 25 to 30 in number. "We made them smoke, though it was evident they did not know the use of tobacco; we likewise supplied them with grog; but I am disposed to think, that they accepted our civilities rather from fear than inclination." (ibid., p.231). Better received were gifts of "knives, beads, awls, rings,

gartering, fire-steels, flints and hatchets; so that they became more familiar even than we expected, for we could not keep them out of our tents." (ibid., pp.231-2). Through his interpreter Mackenzie sought information about the country and especially what lay beyond them in the voyage to the sea. The information received was mostly pure fabrication on the part of the local natives as they related tales about the great distances to the sea, fabulous monsters of unlimited power, and some half truths about two falls in the river. Such stories were discounted by Mackenzie but made quite an impression upon his own Indians who were weary of the journey's hard pace and happy that some real discouragement appeared. It would not be difficult to frighten such men and the leader had considerable trouble to convince them of the folly of their reasoning.

Throughout this encounter the natives entertained with dancing and singing that consisted of brandishing bone daggers in the air, shuffling and leaping about with intermittent cries representing various animals. Both men and women took part. Mackenzie was struck by the general lack of cleanliness of the people which could not have enhanced his impressions reported as follows: "They are a meagre, ugly, ill-made people, particularly about the legs, which are very clumsy and covered with scabs. The latter circumstance proceeds probably from their habitual roasting them before fires. Many of them appear to be in a very unhealthy state, which is owing as I imagine, to their natural filthiness. They are of moderate stature, and as far as could be discovered, through the coat of dirt and grease that covers



them, are of a fairer complexion than the generality of Indians whom are the natives of warmer climates." (ibid., p.234). Mackenzie spent over eight hours with these natives and recorded facts about their clothing, shelter, implements, personal adornments. He learned also about their canoes and something of their relations with neighbouring tribes. At the end of this encounter the explorer obtained, through gifts, one of the company to act as guide beyond this point. In fact, this native was virtually forced to accompany the party, and Mackenzie was compelled to keep a close watch on him to prevent his escape.

Monday, July 6, 1789. Travel began at three o'clock in the morning in raw, cloudy weather. They left the camp under Bear Rock to encamp again at half past seven by the south edge of East Mountain nearly 110 miles downstream, thus averaging six and one-half m.p.h. for the day. These are remarkable distances, but the current must receive credit for being a great help. Through this part of the river, the current runs up to four m.p.h. so that drifting alone for $16\frac{1}{2}$ hours would have accomplished 65 miles. The men had to paddle virtually 40 miles, at a rate of less than three m.p.h. Mackenzie's estimated distance was 79 miles.

On the journey through the river from the present site of Fort Norman to the East Mountain the river is never under a mile wide and frequently it widens to three and sometimes four miles where it divides to surround islands. Mackenzie noted they passed many islands which were nearly all flanked to some extent by shoals. The banks on either side are in places up to 150 feet high. For the most part however, they are lower being 20 to 40 feet high,

beyond the river, but timbered land rises steadily to the Norman Range on the east. On the west side at a greater distance is the mountain front of Mackenzie Mountains. The native guide explained to Mackenzie that these mountains were the home of "great numbers of bears and small white buffaloes" and "also inhabited by Indians". (ibid., pp.240-1). It is presumed that the inadequate descriptive power of this native or the language difficulty prevented a closer identification of the "small white buffaloes" as either mountain goats or sheep that live in the region.

When they camped beneath East Mountain, Mackenzie made an effort to climb it, but was "almost suffocated by clouds of mosquitoes" (loc. cit.) and forced to give up. He could see, however, the Mountain River flowing from the west and joining the main stream a short way down from their camp. Mackenzie also saw rippling current or rapids in the course below the mountain on which he stood and now known as Sans Sault Rapids. He had to pass them the next day.

Tuesday, July 7, 1789. At four o'clock the party left and crossed to the west side of the river in order to avoid the rapids seen the night before. In so doing, it became apparent that there had been no real need to make the detour. Learning this Mackenzie began to doubt the existence of dangers along the river reported by the natives a couple of days previously. The party passed downstream between banks 100 feet or more high and was guided through the rapids above the Ramparts by some natives encamped by Tsintu River. Soon the walls of the Ramparts could be seen and

the group stopped to examine this narrowing of the river where it becomes confined between perpendicular cliffs of limestone or white rock as described by the explorer, that rise over 200 feet above the water level. Throughout the whole of this part of the river course the water flows quickly varying from five m.p.h. at Sans Sault Rapids to four m.p.h. along the island dotted run to Rampart Rapids. These rapids cause the current to increase to six m.p.h. When the river enters the Remparts proper the water flows more quietly and deep. The group followed some Indians through and noted the current had not increased, and in fact, it was reduced to about three m.p.h. The river is not more than one-quarter mile wide and Mackenzie found 50 fathoms of water when sounding. At this point, the natives informed him that they would meet no more obstructions in the river. In passing along farther they saw Jackfish Creek and the wider mouth of Hare Indian River. According to the records in the journal they continued an additional nine miles following a course west then north-west. When they camped that night it was probably in the vicinity of the mouth of Loon River, possibly on the west shore. A landing place must have been difficult to find because the banks along the river are steep, being between 100 and 200 feet high. A few small streams, however, flowing from the west have cut valleys down to river level and one of them may have supplied enough low ground to accommodate a small encampment.

The total distance for the day recorded in the journal is 36 miles, but for some stretches of the journey no distances were set down. In fact, they probably travelled about 55 miles which

was not far considering they put in a 16 hour day.

The low daily mileage was occasioned by frequent encounters with encampments of natives. The first camp of about 18 people was by Tsintu River. Below the Ramparts, probably at the mouth of Jackfish Creek, a larger group of 36 individuals was living. This is the present site of Fort Good Hope, a location noted for its good fishery. Mackenzie recorded that they had plenty of high quality fish to share with him. Some of these natives followed Mackenzie farther downstream to Hare Indian River where another camp of 22 people supplied the group with fresh rabbit and partridge meat. A few miles downstream they stopped again to receive gifts of more rabbit meat from another small encampment. These visits, apart from the time consumed in landing, formalities and departures, caused further delay as Mackenzie tried to learn what he could about the country. On each occasion the natives' turmoil at seeing strange white people for the first time had to be calmed with gifts of metal instruments and decorations. Such rites were usually followed by native curiosity, entertainment and food. It was impossible to cover long distances with these delays.

Wednesday, July 8, 1789. The short distance travelled on the previous day may well have prompted Mackenzie to get an earlier start as he did at half past two on this morning. This was possible in a land with such long hours of daylight. The apparently heavy concentration of population in the lower reaches of the river still commanded his attention. He stopped only a short way from their camp to distribute gifts to 9 Indians, without leaving the canoes. Soon again he encountered another

group on the north shore encamped "beneath a hill" (ibid., p.245). It is not possible to locate exactly this camp of 25 natives as a hill, or more properly, an upland lies along the north side of the Mackenzie River for some 25 miles below Tieda River. Further upstream, most natives had been found where a river or stream joins the main river, so that these natives likely occupied a similar site, possibly even Tieda River itself which drains Yeltea Lake, a large lake on the upland. In any case, it was here that Mackenzie learned that the natives called themselves the Hare Indians and it seems likely were probably part of the same tribe that donated rabbit or hare meat to the expedition on the previous day. Mackenzie took the opportunity of this meeting to exchange his guide. The guide he had was either a Slave or Dogrib from Great Bear River and it was becoming increasingly difficult to prevent him from escaping as he got farther from his home. For this reason, and also because another guide would know the local area better, the explorer literally compelled one of the Hare Indians to accompany him downstream.

Farther on the party encountered eight more Indians on the east bank who described an island in the river, Manitou Island, as having a spirit behind it who swallowed every person who approached. That island might have been any one of many which choke the wide main channel of Mackenzie River below Ontaratue River. Here the main river flows between gently sloping banks in a broad plain some 15 to 20 miles across and covered with hundreds of lakes. In part this stretch is known as the Grand View for it gives unimpeded vistas toward the west and the Mackenzie Mountains

beyond. This grand view was not likely open to Mackenzie on this part of the journey because the journal reports "a fog prevailed the greater part of the day, with frequent showers of small rain". (ibid., p.247).

During the $17\frac{1}{2}$ hours of travel on this day Mackenzie estimated his total distance at 66 miles. The measured distance from a map is 100 miles.

Thursday, July 9, 1789. During the night the unwilling guide deserted but Mackenzie compelled another to accompany him. Possibly the replacement came from a group of natives who followed the canoes. At least according to the journal they had not camped in the presence of natives. To prevent any Indians from coming in pursuit of their shanghaied companion, Mackenzie removed the paddles from nearby Indian canoes. The day's travel began after night thunder storm at half past three in the morning. The course was generally westward and along part of the river which is plagued by shifting sand bars and channel constructions. The width of the whole stream is rarely under a mile wide and is usually one and one-half miles wide. The river flows between high banks at least 100 feet, and more often 200 feet, which are composed of clay with occasional outcropping of shale, limestone and sandstone. The constant attack of the river would at the time of Mackenzie's passage, as now, have exposed bare soil in the form of scarped banks, although some stretches were wooded with spruce, willow, poplar and pine down to the water. At eight o'clock that night the group camped on the east bank of the river just above the Lower Ramparts at Arctic Red River. The total distance for the day as estimated by

Mackenzie was 53 miles, which is certainly short of 70 miles measured on the map.

In the course of the day, Mackenzie encountered more natives stationed along the river, but these new people belonged to another band or tribe whose name he gives as "Deguthee Dinees" or "Quarrellers" (ibid., p.254). These are known today as the Loucheux Indians. The first encounter with them occurred a short distance from that day's starting point, possibly on the banks of the Mackenzie where Travaillant River joins the main flow. The Hare Indian guide painted a dark picture of the new people indicating that they should be avoided. Later Mackenzie heard the Loucheux speak derisively of the Hare Indians, which would indicate that the former people regarded themselves as a superior group. Being from the same linguistic stock there was no language barrier between the Hare Indian guide and these strangers, and even the English Chief could understand their speech although he himself was not understood (ibid., p.249). Mackenzie clearly believed these natives to be a more self-respecting, upstanding lot than others previously encountered. There were some 15 in the group.

Following the usual custom of distributing gifts he persuaded one native to accompany him as a guide for the unknown downstream passage. This Indian told them they were ten to eleven days from the sea, and in about three nights they should meet the Esquimaux. Later in the day Mackenzie found a larger band of about 40 people, who, apart from being fascinated by blue beads, told the explorer that "from the place where I this morning met the first of their

POINT SEPARATION to BEAUFORT SEA



0 5 10 20 30 40
Miles

BEAUFORT SEA

Pullen I.

Hooper I.

Pelly I.

JULY 12, 13 -
Garry I.
JULY 14, 15

Kendall I.

Richards Island

KITTIGAZUIT

JULY 16

JULY 11

Langley
Island

Tunuvuk

-?- JULY 17

Caribou

REINDEER
STATION

-?- JULY 18

East Hills
Channel

Jonas Lake

-?- JULY 19

Sitidgi
Lake

West Channel

JULY 10

Middle
Channel

Campbell
Lake

-?- JULY 20

Kugluk R.

Travillant R.

Travillant
Lake

Point Separation

RICHARDSON

MTNS.

B.S.

tribe, the distance overland, on the East side, to the sea, was not long, and that from hence, by proceeding to the Westward, it was still shorter. They also represented the land on both sides as projecting to a point" (*ibid.*, p.255). The meaning of such information is difficult to comprehend. Presumably the western route described was the one Mackenzie followed, i.e. the Mackenzie River. The eastern route is more difficult. A couple of possibilities exist. A journey up the Travaillant River to Travaillant Lake with portage over the height of land to the upper reaches of Kugaluk River would bring a traveller to the sea via Liverpool Bay. It is not known whether this is an easy passage or whether the river is a reliable route for canoe travel. Perhaps a more likely link to the sea would be via Thunder River. This river, a few miles upstream from the Loucheux encampment, drains one of a series of long lakes which occupy the floor of an old meltwater channel. Between this lake and the next to the east is a low saddle or portage which, when crossed, leads a traveller eastward through the chain of lakes to a tributary of the Iroquis River. This in turn, flows into Carnwath River and ultimately into the Anderson River and thence to the coast at Liverpool Bay. Although the river links on this route, particularly near the headwaters, are very serpentine, it remains a plausible pathway because the lakes provide a regulated and reliable flow throughout the travelling season. It appears that only one portage is necessary to make this journey.

Friday, July 10, 1789. Soon after departure at four o'clock "The river, which here becomes narrower, flows between high rocks"

(ibid., p.256). This refers to the Lower Ramparts, a stretch of water about eight miles long above the mouth of Arctic Red River. The Mackenzie is confined between high banks up to 300 feet above the water which are composed of shale. The stream is ^{between} one-half and three-quarters of a mile wide and the current flows four and one-half m.p.h. Below the Lower Ramparts the river banks become progressively lower and once again a less restricted view of the surrounding countryside is possible. Mackenzie noted this and also remarks on the general absence of the mountainous country that had been a daily experience throughout most of the journey so far. Farther to the west Mackenzie observed and snow-capped Richardson Mountains which he estimated to be distant, about 10 miles, although they were at least 35 miles away.

Mackenzie describes the country further downstream in the following words: "here the river widens, and runs through various channels, formed by islands, some of which are without trees, and little more than banks of mud and sand; while others are covered with a kind of spruce fir and trees of a larger size than we had seen for the last 10 days. Their banks, which are about six feet above the surface of the water, display a face of solid ice, intermixed with veins of black earth, and as the heat of the sun melts the ice, the trees frequently fall into the river" (ibid., pp.256-7). There can be no doubt that this description refers to Point Separation or the place where the Mackenzie River divides to begin the distributary pattern of its delta. The various channels, exposure of ground ice, collapsing banks, bare islands and forested islands are all part of the characteristic delta scenery.

The multiplicity of channels by which the river makes its way to the sea posed a problem for Mackenzie as to which route he should follow. His native guide preferred the East Channel, mainly because he felt it would avoid contact with the hated and feared Eskimos. However, Mackenzie determined the principle by which he proposed to navigate through the delta. He decided to follow the largest river wherever a multiple choice appeared. Thus he chose the middle channel of the river which was the largest and led due north, and in support of this decision was Mackenzie's curiosity about the Eskimos. If necessary there would always be a later opportunity to take a more easterly route.

With the mountains of the west still in view Mackenzie determined his latitude at 67°47' north. The river at this latitude crosses just above the point where the East channel departs middle channel and swings away to the east. It is not possible to say whether Mackenzie made a correct observation or not, but it is thought he was approximately on this stretch of the river. Clearly a latitude this far north was unexpected, for his reckonings placed him farther south, but he recognized that he may have underestimated the eastward variation of the compass. In any case, this new latitude convinced Mackenzie that the long river drained into the Hyperborean or Arctic Sea. In spite of low provisions, which could have been a critical handicap on the return to Athabaska, it was his purpose to complete the exploration. Such a decision met with considerable opposition. The guide had not been to Benahullo Toe or White Man's Lake as the ocean was known to the natives. This reference to white men must have been hearsay for the Indians, for

certainly none had been in actual contact with whites before Mackenzie's journey down the river. Instead, tales of white men came from the Eskimos who through their tribesmen to the west had traded iron from the Russians. (Behring had passed through the straits now named for him in 1728, and this was followed by increasing Russian interest in Western N. America. (Morton, 1939, p.367; See also Burpee, 1935, Vol. 2, p.437). Whatever the native impression of the Arctic Ocean was, it was filled with apprehensions so it was not difficult for the guide in Mackenzie's party to convey his distress to Mackenzie's own Indians. Indeed, so strong was his opposition, Mackenzie promised he would continue towards the mouth of the river for only seven days more, a promise which at once satisfied the crew. That night they landed at eight o'clock after travelling the estimated distance of 48 miles. By comparing the course directions and distances with the river as it is now known, it is possible to locate the campsite on the banks of the middle channel at latitude $68^{\circ}15'N$, where there is now a large meander cut-off. This loop was still complete when Mackenzie made his journey because it was mapped intact by Franklin in 1826-7, and Sainville's map of 1898 shows the beginning of the break through (Franklin 1828; Sainville, 1898). If this was the true location of Mackenzie's camp, then he had travelled during the day slightly more than 75 miles.

Saturday, July 11, 1789. During the night Mackenzie had his first good opportunity to view the midnight sun, although he had been sufficiently far north for the preceeding few nights. Upon departure from the campsite at 3:45 a.m. they found the river

headed generally northwest, but "taking a very serpentine course" (Mackenzie, 1902, p. 259). About seven o'clock they could see a ridge of high land ahead. This ridge is the south end of the Caribou Hills that form the eastern margin of the present Mackenzie Delta. When following the Middle Channel they first came into view at the junction with Oniak Channel which leads to the eastern side of the delta. It seems from this evidence that Mackenzie had covered 25 miles in about three and one-quarter hours, or was moving downstream at the rate of seven and one-half to eight m.p.h. Five hours later, he landed at a site once occupied by natives. Judging from the time interval and his average rate of travel, the stopping place was about 40 miles downstream from Oniak Channel or about latitude $68^{\circ}53'N$. The abandoned camp was identified as Eskimo from the bits of whale-bone, thick burned leather, spilled oil that were observed. It was assumed that the natives found the site attractive because of the good fishing, especially after Mackenzie was surprised by a fish jumping into his canoe. The place was marked by a lone tree standing "like an English May-pole" (*ibid.*, p.260), yet only a few miles downstream, islands in the river were seen supporting no trees except dwarf willow. These observations represent a description of the tree line in this section of the delta, and the location, as described by Mackenzie, is virtually the same at present.

The precise course the exploring party took from the tree-line to the sea is difficult to follow. They reached a place where "the river widens -- then flows in a variety of narrow,

meandering channels, amongst low islands .." (loc. cit.). Clearly, this is the section of the Middle Channel at Latitude 68°57'N. From this place, the water of the Middle Channel breaks up into three main channels and a couple of smaller ones. Mackenzie, therefore, was faced with three possible routes. One route leads westward and empties within 25 miles into the large estuary of Mackenzie Bay. This was not the channel followed by the explorer because it leads through low lying islands with no high land along the route as reported in the journal (ibid., p.263). A second main channel cuts to the eastward to Tununuk and the southern end of Richards Island. This island is part of an older Mackenzie delta which now stands as high land lying to the north-east of the present delta. Its sides are cliffed, exposing layers of sand, silt and some gravel, and rises 100 feet or more from the present water level. The third channel of the three main distributaries is the central one which leads in a meandering course to the northwest and joins the second channel below Tununuk. Mackenzie could have followed either of these two routes. The evidence, however, favours the central channel. If Mackenzie went via the eastern distributary within a short distance he would certainly have seen the round island of Tununuk as well as the broad East Channel of the Mackenzie flowing directly to the sea. None of these features are mentioned in the journal. The central channel, on the other hand, continues in the same general direction that Mackenzie had travelled throughout the day. Also, if followed, it would not bring Mackenzie next to the high ground for 55 more miles, or until the following day when, indeed, it is described in

the journal.

During the afternoon, Mackenzie stopped to examine three permanent native houses built of driftwood and covered with wood, grass and branches. Part of the design involved excavation of the floor below ground level to a depth of two feet. Such permanent dwellings constructed in this manner on the low land of the present delta may have been subjected to flooding. The banks of the channels are not more than seven feet above the water, and depending upon the exact location of this camp may well have been only five feet high. These levels are dangerously low in flood periods and high water during spring flood or caused by prolonged winds from the northwest or both, could force the evacuation of the camp.

A rational choice of such a precarious dwelling site by the Eskimos would suggest that some advantages were to be enjoyed. Driftwood, present on most channels, would not be a locating factor. More likely, the site was chosen in relationship to fishing possibilities or access routes to the sea and sea life.

Mackenzie's camp on July 11 is impossible to fix. He reckoned his day's travel at 54 miles allowing for the winding route. In fact he had travelled farther than that by noon. The afternoon journey broken by the campsite investigation, did not add much more to the morning total. By the time they camped at eight o'clock at night they probably covered 80 miles.

That night the uncertainty of the route and fear of the future appears to have raised the fears of Mackenzie's Indian companions. The guide continued to paint a bleak picture, and it

was necessary to settle gifts upon both the guide and the English Chief to ensure their continued allegiance.

Sunday July 12, 1789. In cold, damp weather brought on by the night rain, the group continued on the same meandering course as the preceeding day. At mid morning Mackenzie encountered four more huts, exactly the same as the type seen on the day before. They were built next to the high land of Richards Island and dug into ground that was thawed only to four inches depth. Also ground ice was apparently exposed on the hillside where snow still remained in the valleys. Mackenzie observed that the banks were composed of yellow clay mixed with stones. Such deposits only occur in the old delta since the modern delta is built of finer sediments. Thus a description of clay and stone confirms that the explorer passed along the western edge of Richards Island.

Downstream from the Eskimo camp, they came to a point where "the current was very strong", and "we appeared to have come to the entrance of the lake. The stream set to the west, and we went with it to a high point, at a distance of about eight miles, which we conjectured to be an island, but, on approaching it, we perceived it to be connected with the shore by a low neck of land. I now took an observation which gave 69.1 N. latitude." (ibid., p.265).

Mackenzie had been following the channel which divides Richards Island from Langley Island on the west. This is the only course which could take him past the high edges of the old delta, and the channel does widen as he describes, about 12 miles upstream from where it empties into Mackenzie Bay of the Arctic

Ocean. Other circumstances correspond with the journal description. It is likely that this is the outlet of Mackenzie's Voyage for the stream does set to the west (magnetic), and at the end of the channel on the north side is a high island standing as an undestroyed outlier of the old delta sediments. The summit of the island is over 50 feet above the water and is an obvious landmark in contrast with the very low land of the modern delta. The low angle of Mackenzie's view from his approaching canoe caused the high ground to seem isolated, but as he drew nearer, it became evident that it was not an island but joined to the low surrounding delta lands.

The most perplexing record from this entry in the journal is the latitude observation. Tracing Mackenzie's journey on modern maps places his true latitude at $69^{\circ}22'N$. as opposed to his recorded $69^{\circ}1'N$. The combination of the high viewpoint and open lake to the west does not exist in the vicinity of $69^{\circ}N$. The reason for this discrepancy probably lies in the fact that Mackenzie had only the barest familiarity with surveying instruments at the time of his voyage, a fact which he himself recognized and rectified by taking formal instruction before embarking on his other great explorations to the Pacific Ocean.

The journal description continues - "we continued the same course for the Westernmost point of an high island, and the Westernmost land in sight, at the distance of fifteen miles.

"The lake was quite open to us to the Westward and out of the channel of the river there was not more than four feet of water, and in some places the depth did not exceed one foot.

From the shallowness of the water it was impossible to coast to the Westward. At five o'clock we arrived at the island, and during the last fifteen miles, five feet was the deepest water. The lake now appeared to be covered with ice, for about two leagues distance, and no land ahead, so that we were prevented from proceeding in this direction by the ice, and the shallowness of the water along the shore" (loc. cit.).

There is no doubt that the island upon which Mackenzie landed is the same one presently known as Garry Island. To reach it he had to maintain the same general course he had followed for the previous day. It is as he describes it, a high island, over 150 feet and is the most westerly outlier of the high land of the ancient delta. No high land, indeed, no islands at all lie to the west, and the open lake reported in the journal could only be Mackenzie Bay. The bay has a vast open expanse but is surprisingly shallow. The water is seldom over one fathom deep, and in many places is much less. Mackenzie crossed fifteen miles of shallows from the end of the river channel to the new island which is approximately the full distance to the western end of Garry Island.

When the tents were pitched at this new camp, Mackenzie and his companion, the English Chief, climbed to the summit nearby. From this viewpoint 187 feet above the sea, they could see nothing but ice covering the bay through a wide arc from the southwest around to the east. Far to the west they saw the peaks of the Richardson Mountains on the opposite side of the delta, which continued northwest beyond the edge of the ice pack and gradually

diminished from view. These mountains, at least their front edge, are only slightly more distant than the twenty leagues estimated by Mackenzie and are easily visible even to where the Richardsons merge with the British Mountains and the whole chain curves away to the west towards Alaska. The view to the east gave the explorer the impression of many islands which form the ragged outline of the northern edge of Richards Island, and include such offshore remnant islands as Pelly, Kendall, Hooper and even Pullen Islands. It is with this grand vista that Alexander Mackenzie and his English Chief were able to survey the mouth of the long river and the Arctic sea into which it emptied. At Garry Island they had reached the boundary of their voyage.

Although this was the point from which the return journey began, there is evidence that Mackenzie still did not recognize he had reached the mouth of the Grand River. He records "my people could not, at this time, refrain from expressions of real concern, that they were obliged to return without reaching the sea: indeed, the hope of attaining this object encouraged them to bear, without repining, the hardships of our unremitting voyage. For some time past their spirits were animated by the expectation that another day would bring them to the Mer d'ouest: and even in our present situation they declared their readiness to follow me wherever I should be pleased to lead them". (ibid., pp.266-267).

The lack of recognition of the Arctic Ocean was probably a result of a combination of factors. In the first place, Mackenzie could not have had a clear idea about the body of water

into which his river emptied. Throughout the latter part of the journey the Loucheux guide always represented to the party's imminent arrival at a lake. (*ibid.*, pp.258, 262). Even the combined scenery of the changing landscape - first low lying country and devious river courses followed by a wide and open expanse of water - may not have seemed the ultimate destination for that drainage. He had in fact, passed through similar terrain when he made his way through the Slave River delta only to find that river emptying into Great Slave Lake. Additional uncertainty about the identity of the new, large body could have arisen when they found that the water was still fresh and very muddy from the river discharge. Perhaps, also, Mackenzie was not expecting to arrive at the Arctic Sea so soon because this new lake was only three nights downstream from the place where Indians informed him he would need ten more nights before he saw the ocean. That Mackenzie thought he had entered a lake seems to be supported further by the remark "we appear to have come to the entrance of the lake" (*ibid.*, p.265), - probably meaning the lake anticipated by his guide.

Certainly Mackenzie knew of Hearne's arrival on the Arctic Sea seven years before, and that his latitude was about 68°North. If this were true, it appears that Mackenzie saw no connection between that discovery and his own "lake" at 69°N. Part of the reason may lie within the man himself. Much has been made of a Scotsman's stubbornness in many circumstances. Mackenzie does exhibit on this journey a reluctance to accept facts until he is overwhelmed by the evidence. For instance, he never confided

to his journal that the great river would lead to the Arctic instead of the Pacific until he reached Pt. Separation, the head of its delta. Yet all the journey below Camsell Bend was along the base of the high mountains to the west, and everywhere he saw substantial rivers draining into the Grand River from a western divide. During this course the general direction was northward as much as it was westward so that each day the Mer d'ouest as a possible destination became more remote. Still, admission of this by Mackenzie was long delayed. It seems that as he stood on Garry Island looking toward a watery surface stretching north and west that he had not yet found the compelling proof he needed.

Monday, July 13, 1789. Being unconvinced that his journey could not be continued, Mackenzie waited during this day to see if the ice pack would clear away in response to the strong winds and permit further progress. As usual, the men set their fish nets overnight. Before long, the party discovered the water rising and had to move their gear to higher ground. This description would suggest that they had camped on the beach under the bluffs of the island, possibly on the spit that is built southwards from the western end of the island. The high water, instead of being recognized as tide, in all probability, was attributed to the high wind the previous evening that prevented the men from checking the nets. (*ibid.*, p. 266). When the nets were reached they produced a fish, the size of a herring, that was unknown to Mackenzie. The English Chief recognized it as a type caught in Hudson Bay. Thus evidence that instead of a

lake this was the ocean continued to mount.

Mackenzie took observations on his position again, this time fixing the latitude at $69^{\circ}14'N$. Later dead reckoning determined the longitude at $135^{\circ}W$. (ibid., p.268). The true coordinates of the spit on which they may have camped are $69^{\circ}29' N$. and $135^{\circ}48'W$. A discrepancy of 15 minutes of latitude on this observation is of about the same magnitude of difference as the last observation in the delta, namely 21 minutes of latitude.

Retracing his steps to the top of the island, Mackenzie found that the strong wind blowing since noon had failed to move the ice pack. This time, however, he "could just distinguish two small islands in the ice, to the North-west by compass" (ibid., p.269). The description is unclear as to whether the islands were barely distinguishable because of the distance, size and height of the new islands in relationship to the ice pack or the weather. Judging from their alleged size and the compass direction Mackenzie may have seen the single low bar a few miles northwest by compass from the island. There is no way of knowing if this bar was a twin feature when Mackenzie made his voyage, or if the position of the ice made it look like two islands. It is, however, the only land in a northwest compass direction. If the compass direction was wrong, he may have observed Pullen Island and another more to the north. These islands however, are not small and would be clearly distinguishable unless weather obscured visibility.

Tuesday, July 14, 1789. In the morning the men took after

some whales in canoes but were prevented from capturing or killing any because of the fog. Mackenzie considered it fortunate that the fog intervened, as the animals were much larger than the largest porpoise, and so far as they could see, they were all white. The guide claimed these animals were caught and eaten by the Eskimos. If this new phenomena of whales which Mackenzie likened to porpoises, did suggest to him that he had reached the sea, it is not written in his journal. On the other hand, Mackenzie did recognize he would not proceed farther north and before attempting the return journey, he "ordered a post to be erected close to our tents, on which I engraved the latitude of the place, my own name, the number of persons which I had with me, and the time we remained there." (ibid., p.271).

At noon when the fog lifted, they embarked to examine the ice, but a sudden wind from the northeast and returning fog forced them to retreat, and with difficulty they managed to find shelter behind their island. The journal states "we continued our course along the islands, which screened us from the wind,... in the hopes of meeting a party of the natives ... At eight we encamped on the Eastern end of the island which I had named Whale Island." (loc. cit.) It is perplexing to read that Mackenzie had sailed in the lee of islands, because earlier he sought shelter behind the island upon which they had camped. Later, however, they landed on the island which Mackenzie had named Whale Island. It is concluded, therefore, that Whale Island of Mackenzie and Garry Island are one and the same.

Wednesday, July 15, 1789. About four o'clock in the morning Mackenzie awoke to discover water had risen for the second time and the gear was becoming wet. But this time the rise was accompanied by a strengthening of the wind. He recognized that the tide must have been responsible for the change, and he continued to observe it rise until six o'clock. Being uncertain of his observation, Mackenzie determined to remain over night to check it again. Besides the wind prevented him leaving.

Now that the observations of whales, of fish similar to those in Hudson Bay, and of a landless sea to the northwest had been joined by an apparent tidal rise and fall, Mackenzie must have realized he had reached the sea. Although he did not record this conclusion in his journal, it is clear that the return journey, pressed upon him by dwindling supplies, could now be entered upon with doubtful satisfaction of success in discovering the Arctic Sea. The hopes and expectations that this new route would lead to the Mer d'ouest were now completely discredited. This disappointment alone seems to have overshadowed any enthusiasm for trade possibilities along the great route newly discovered. Within his lifetime, however, Mackenzie's River of Disappointment became an avenue of prosperity both for himself and his North West Company associates.

The Return Journey.

Thursday, July 16, 1789. Bad weather during the night and morning introduced uncertainty about the accuracy of the observations of tidal range; it measured about 16 to 18 inches. With

this task complete, Mackenzie embarked and steered south among the islands hoping to encounter natives. But he soon gave up and "accordingly made for the river, and stemmed the current". (ibid., p.273). The water was shallow enough to use their paddles as poles, pushing on the bottom. They camped at seven in the evening. There is no indication of distance travelled during the day so that it is impossible to tell what progress was made upstream. Possibly they reached the base of the high ground at Richards Island or one of the meander bends where a high cut bank provided suitable dry ground. Once away from the cold sea water and in among the delta islands there was a noticeable change in temperature, a compensation to be marred by clouds of mosquitoes.

Friday, July 17, 1789. The ritual of long, hard days began again when the group took to the water at four o'clock in the morning. Somewhere on the river they missed the entrance of the stream which connects directly to the Middle Channel. Instead, Mackenzie's party followed around the broad meander loop to the southern end of Richards Island. It might have been that along the bluffs of the island over 100 feet high Mackenzie saw four different native encampments that appeared abandoned only recently. At the south end of Richards Island they "landed upon a round island, close to the eastern shore, which possessed somewhat of a sacred character, as the top of it seemed to be a place of sepulture from the numerous graves we observed there" (ibid., p.274). The island so described as Tununuk. More recently this has been known locally as Devil's

Island, because it was a burying ground in the past. Mackenzie found many remnants testifying to the Eskimo culture of the people who made use of Tununuk.

The progress upstream was now via the East Channel of the river and they soon noticed the first spruce trees both on the islands and in the sheltered valleys along the edge of the Caribou Hills. The presence of trees was perplexing for Mackenzie in the face of observations showing the ground had not thawed deeper than five inches from the surface. After camping on the east side of the river, Mackenzie climbed to the flat top of the flanking hills and "had a delightful view of the river, divided into innumerable streams, meandering through islands, some of which were covered with wood, and others with grass. The mountains (Richardsons') that formed the opposite horizon, were at the distance of forty miles. The inland view was neither so extensive nor agreeable, being terminated by a near range of bleak, barren hills, between which there are small lakes or ponds, while the surrounding country is covered with tufts of moss, without the shade of a single tree."

(ibid., pp.275-276).

The location of Mackenzie's campsite cannot be fixed precisely. It is certain that they had passed south of the tree-line. Along the east channel the first trees are in evidence only five or six miles south of Tununuk on the two large islands in the middle of the channel. A few miles upstream the valleys on the mainland contain spruce, but as the explorer observed, none occur on the summits of the hills. On this basis,

the camp was probably set on the east bank twelve miles or so upstream from Tununuk. At this location a view of the delta and the inland areas from the Caribou Hills is very much like that given by Mackenzie in his journal.

Saturday, July 18, 1789. The day began at three o'clock in the morning and they did not camp until seven in the evening, - altogether sixteen hours of work. Mackenzie walked most of the day along the edge of the hills in the company of the English Chief, while the remainder of the party brought the gear and canoes up the east branch against the two m.p.h. current. The walking was fatiguing because, in spite of the high land, the surface was frequently wet and marshy although the ground had thawed no deeper than six or eight inches. With hard walking during the long day they could have covered more than thirty miles. The journey was in a fairly straight line along the edge of the Caribou Hills, past the present Reindeer Station, to a place where the hills become subdued and lose their identity in the general level of the country. This occurs near the south end of Harrison Island in the delta. Mackenzie described the high land in the following words: "the face of the high land, towards the river, is in some places rocky, and in others a mixture of sand and stones, veined with a kind of red earth, with which the natives bedaub themselves" (ibid., p.277-278). Red beds are still visible as bands running horizontally along the hill side, and appear to be the result of burning of peat or some other organic deposit.

Sunday, July 19, 1789. Rain and strong wind from the north

delayed the usual early departure until after eight in the morning. During the stormy night, the native guide, perhaps feeling more secure after he had returned to the forested land deserted the company to make his way back alone. After the weather cleared Mackenzie chose to keep to the east channel close to the mainland. This route, being narrower than the wide Oniak Channel leading to the main branch of the river, had a more gentle current against which he could move with greater ease. At a place identified only as one previously occupied by Indians they camped at eight o'clock. If they covered as much distance as the previous day this campsite was in the general vicinity of the present new townsite of Inuvik.

Monday, July 20, 1789. The exploring party broke camp at three in the morning, then heavy rain forced them to stop at two o'clock in the afternoon. But by then they had passed the river where Mackenzie expected to meet Eskimos. It is suggested that this river was Campbell River, the only sizeable tributary entering the delta from the east. Moreover, it drains Campbell Lake and is part of a portage route through Sitidgi Lake to the southern end of the Eskimo Lakes. Such a natural route from the lakes to the delta would be a logical meeting place for natives.

It is not possible to pinpoint Mackenzie's campsite on the 20th. He had travelled eleven hours and against a current the party could scarcely make more than two and one-half to three miles in each hour, or a total distance of 30 miles at best. This would take them past Campbell River to a point about 35 miles downstream from Pt. Separation which he passed the follow-

ing day. The location could also fit with Mackenzie's description "the ground close to the river does not rise to any considerable height and the hills which are at a small distance are covered with spruce fir and small birch trees, to their very summit." (ibid., p.279).

Tuesday, July 21, 1789. Since the previous day of travel was shortened by the afternoon storm, Mackenzie embarked very early at half past one in the morning. He followed the East Branch until ten o'clock, he "left the channels formed by the islands for the uninterrupted channel of the river, where we found the current so strong, that it was absolutely necessary to tow the canoe with a line." (loc. cit.).

The process of lining the canoes was carried out in the following manner: Two men went on shore and towed for a two hour period. Those remaining in the canoe would help with paddles to keep the boat in sufficiently deep water and avoid such hazards as boulders or projecting trees. Then another two would take up the line for their two hour shift. At first, after entering the main flow of the Mackenzie, the banks are low and therefore walking along the shore was reasonably easy. When the party reached the Lower Ramparts above Arctic Red River progress became increasingly difficult. "The land on both sides was elevated, and almost perpendicular, and the shore beneath it, which is of no great breadth was covered with grey stone that falls from the precipice." (loc. cit.) In spite of the physical strain of walking and pulling against a strong current, over unstable slopes of sharp fragmental talus, they experienced the

danger of more falling rocks from the cliffs above. Yet they made good time and that night at half past eight camped at the same site on the east side of the river that they occupied on the downstream journey, twelve days before. The day's journey was probably about fifty miles.

Wednesday, July 22, 1789. With an early start at half past three in the morning the arduous towing continued, along the shore of the east bank. Mackenzie walked with natives who visited his camp the night before and after three hours difficult travelling reached their huts. They passed a narrow, deep river, where the Indians had set nets, which was likely the river presently named Pierre Creek. While with the natives, Mackenzie observed their way of life, and had the English Chief question them about their circumstances and their land. From this he learned of the enmity between the Indians and the Eskimos, and also that the Eskimos had traded iron with white men in the vicinity of Belhoullay Toe or White Man's Lake, i.e. along the Arctic Coast.

For most of the day travel was by means of the towline except for short periods when the wind was right for sailing. They toiled $16\frac{1}{2}$ hours before camping that night. The campsite cannot be fixed positively because although they had started towing along the east bank, during the time while sails were employed they could have changed sides of the river. In any case, it is possible to make an estimate of the day's distance at 55 - 60 miles based upon their average progress of three and a half miles per hour. This rate was calculated from known travel time and distance between camps on July 21st and 23rd.

Thus their camp for the night probably was ten miles or so downstream from Travaillant River.

Thursday, July 23, 1789. The pace Mackenzie set for his party was exhausting. Again he forged on for fifteen hours beginning at five o'clock in the morning. Throughout the whole day they had difficulty proceeding along the beach, and had, at all times, to employ the tow line against the strength of the current. By eight o'clock in the evening, however, they were able to camp at a familiar campsite, the same one occupied on July 8th which was probably located on the east bank of Mackenzie River about five miles upstream from Thunder River. This day brought the party about fifty miles closer to their home base.

Friday, July 24, 1789. At first it appeared as if this day would be a repetition of the tedious towing of the previous one. The men began at five in the morning, but were able to stow the tow-line and employ sails and paddles before a favourable breeze after ten o'clock. During the early morning, while working their way along the east shore, they passed a small stream on either side of which the natives collected flint. "The banks are high, steep and soft rock variegated with red, green and yellow hues. From the continual dripping of water, parts of it frequently fall and break into small stone flakes like slate, but not so hard. Among them are found pieces of Petroleum, which bears a resemblance to yellow wax, but it is more friable." (*ibid.*, p.287). The place which Mackenzie describes has been located by Hume as the Lower Ramparts.

(Hume, 1913, p.81). Having followed Mackenzie's progress this far, however, it is clear that the description refers to a site upstream from the Lower Ramparts, probably near McBride's Cabin or the former Little Chicago Trading Post. The rocks of this region are the same age as the strata at Norman Wells, so that the suggestion of petroleum is credible. They camped that evening at seven. The site is impossible to locate. If the average progress was approximately three m.p.h. then on this long day they would have travelled at least 40 miles, especially as they had the aid of the wind. The camp must have been, therefore, in the vicinity of, or downstream from, the mouth of Ontaratue River.

Saturday, July 25, 1789. On this day, which for Mackenzie began a quarter before four o'clock, the men found the current slack enough to make headway with paddles and so avoid the difficulties and danger of towing canoes through the shoals at the river's edge. "The inland part of the country is mountainous and the banks of the river low, but covered with wood" (Mackenzie, 1902, p.290). It is true that the land east and north of the river rises in a broken and semi-mountainous fashion, but the river banks on the same side are not low. In places they are over 200 feet high. On the opposite side, however, the banks are consistently low, and the interior country to the west and southwest rises gradually away from the river. Perhaps the brief description by Mackenzie was meant to cover the land on both sides of the river. An approaching thunderstorm forced the men to land just after seven in the evening, but before camping

operations were complete, a very severe but short lived storm broke. The travelling day was long, almost 16 hours in time and about 40 miles in distance. The probable campsite was downstream from Loon River some 10 or 20 miles.

Sunday, July 26, 1789. Mackenzie's account of the country through which he was passing on the return journey is quite incomplete. It is difficult therefore to assign particular days of travel to certain segments of the river. This day, 26th July, is especially difficult. The only clue as to his precise location is described in the following terms: "we passed a river of some appearance flowing from the eastward. One of the natives who followed us, called it the Winter Road River" (ibid., p.293). The most obvious river to fit this description is the Hare Indian River entering the Mackenzie at the present Fort Good Hope. It is a broad stream following an old drainage channel from Smith Arm of Great Bear Lake. The route is a natural one to the great lake, and tributary access streams lead to Belot Lake and Colville Lake or to Carnwath River, Anderson River and the Arctic Coast. Any of these routes could have been the Winter Road mentioned by the local natives. There is a possibility that the river Mackenzie described is the Loon River farther downstream. It is not a large stream, except that it has a wide mouth and would appear fairly large from the Mackenzie River. By following upstream on Loon River natives could reach the Iroquois River or the Carnwath River, both of which drain into the Anderson River and the coast. It is a difficult route and therefore less desirable than Hare Indian River as a means of inland penetration.

The campsite was probably in the vicinity of Fort Good Hope, or downstream 15 miles.

The day was not important for the distance accomplished, but contact with the natives brought intelligence which became a driving force in Mackenzie's life over the next few years. A Dogrib Indian living among the Hare Indians in this area told a tale which was set down by the explorer in the following words:

"He had been informed by the people with whom he now lives, the Hare Indians, that there is another river on the other side of the mountains to the south-west which falls into the Belhoulay Toe or White-man's Lake in comparison of which that on whose banks we then were, was but a small stream, ... that those who inhabit the entrance of it kill a kind of beaver, the skin of which is almost red, and that large canoes often frequent it. As there is no known communication by water with this river, the natives who saw it went over the mountains." (ibid., p.292).

Mackenzie took this description to mean a way to the western sea and the object of his search. He might have recognized the red-skinned beaver as the sea otter, but he was certain that the large canoes were ships of trade from Russia and Britain. From this place upstream, he was anxious to gather all the information concerning a course through the mountains to connect with this river that led to the Belhoulay Toe.

Monday, July 27, 1789. Taking every opportunity to amplify and confirm the native report of the previous day, Mackenzie stopped at an Indian camp below "The Rapids" near the Ramparts.

From the journal entry for the following day it seems that Mackenzie must have camped somewhere downstream from the Ramparts, and could not have accomplished much travel in the five or so hours he had on the water.

Upon questioning the natives, he found that they had no first hand experience of any river across the mountains. They had never ventured beyond the range of mountains immediately west of the river. He did, however, learn the following:

"They had, however, been informed that it (the river to the west) was larger than that which washed the banks whereon they lived and that its course was towards the mid-day sun. They added that there were people at a small distance up the river, who inhabited the opposite mountains, and had lately descended from them to obtain supplies of fish ... I engaged one of them to describe the circumjacent country upon the sand. This singular map he immediately undertook to delineate, and accordingly traced out a very long point of land between the rivers, though without paying the least attention to their courses which he represented as running into the great lake, at the extremity of which, as he had been told by Indians of other nations, there was a Belhoullay Couin, or White Man's Fort. This I took to be Unelascha Fort, and consequently the river to the west to be Cook's River; and that the body of water or sea into which this river discharges itself at Whale Island, communicates with Norton Sound. I made an advantageous proposition to this man to accompany me across the mountains to the other river, but he refused it." (ibid., p. 294-295).

Another group of natives encountered farther upstream when asked about the river to the west produced an answer similar to the description already received. "They likewise mentioned that the sources of those streams which are tributary to the great rivers are separated by the mountains" (ibid., p.297). Without success, Mackenzie tried to pursue discussion about this new river, and later concluded:

"I now found that it would be fruitless for me to expect any accounts of the country, or the other great river, till I got to the river of the Bear Lake where I expected to find some of the natives who promised to wait for us there. These natives had actually mentioned this river to me when we passed them, but I then paid no attention to that circumstance, as I imagined it to be either a misunderstanding of my interpreter or that it was an invention which, with their other lies, might tend to prevent me from proceeding down their river." (ibid., p.299).

The tales concerning the great river flowing to the west had passed through the cultural contacts of several nations of Indians. In so doing, details were magnified, distorted or forgotten. When the story reached Mackenzie, at least third or fourth hand, the intelligence was scarcely more complete than Mackenzie's own knowledge of the north Pacific Coast. It is not surprising that the crude map sketched in the sand by a native with only hearsay evidence and untutored in drawing should provide just the kinds of conclusions for Mackenzie to seize. Under the circumstances it was logical for the new river to join Cook's River, and for the fort to be Unalaska. Since this

information came from the lower Mackenzie Valley, a knowledge of a great river west of the mountains could mean nothing else but the Yukon River and its tributaries. Moreover the pointed land separating the mouth of this river from Mackenzie's river represented the hazy notion of the land forming the northwest quadrant of Alaska. Mackenzie took this to mean the entire Alaska peninsula. He then assumed quite naturally that the fort was Unalaska, a Russian post situated on an island of the Aleutian chain. Instead, the natives probably referred to a Russian trading place at the mouth of the Yukon, but not a permanent settlement known to Mackenzie. He was correct, however, in his conclusion that water communication was possible from the mouth of his Grand River to Norton Sound. Information which indicated that the mountain chain to the west was the divide between two great rivers must have disappointed Mackenzie, but he was now alerted to search for a likely stream that would facilitate effective penetration towards his western goal.

It is interesting and logical to note that first mention of a route westward should come from the northern end of the country. On his downstream passage the natives at Bear River told Mackenzie about such a river but he dismissed the news as another fantastic tale told by the Indians. One can only speculate how the word of the western sea became known to the Mackenzie Indians. There are, however, contacts to the west through the Peel River drainage, the same route which eventually became the fur traders' way to the Yukon. Other contacts could occur through the passes between Mackenzie River tributaries to the

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Steward River or Pelly River drainage.

The length of travel during the day could not have been more than five hours and perhaps 15 miles. This would place their camp at the lower end of the Ramparts.

Tuesday, July 28, 1789. The journal entry for this day provides fairly precise evidence of one location along the route upstream. "This is a place that the Indians call a rapid, though we went up it all the way with the paddle; so that the current could not be so strong here, as in many other parts of the river; indeed, if it were so, the difficulty of towing would be almost insuperable, as in many parts, the rocks, which are of great height, and rather project over the water, leave no shore between them and the stream." (ibid., p.302). This description fits the Ramparts above Fort Good Hope. The whole working day was the usual fifteen hours or so, but much of it was spent visiting native campsites along the river. Most of these had been abandoned temporarily as the news of the approaching party spread upstream in advance. Some people were found, but only supplies of food and no further information came from these short visits. Up river from the Ramparts the stream is wide and full of shifting islands and Mackenzie describes no distinctive topography to help measure his progress. He camped at eight o'clock, probably about ten miles upstream from Hume River.

Wednesday, July 29, 1789. At quarter past four in the morning the group embarked in a cold but suitable wind that carried them under sail upstream at a good rate. They soon

reached Sans Sault Rapids and worked their way over the shallow ledges on the west side of the river. The change in water level since the beginning of the month was quite noticeable and the upward passage was much more difficult. Mackenzie estimated a river drop of five feet (ibid., p.303). The western passage around the rapids brought to their attention the mouth of the Mountain River and it appeared to Mackenzie that it was the largest stream flowing from the west with the exception of the Liard River. This, of course, is not true, but observation of river mouths gives only the crudest estimate of either the volume of flow or size of basin.

Mackenzie and his men travelled for about fifteen hours during the day. On the basis of an average rate of progress upstream of two m.p.h. the camp was probably thirty miles upstream from the last camp which would be ten miles above East Mountain.

Thursday, July 30, 1789. The routine of travel began at four in the morning and continued until seven in the evening. The canoes were able to make use of their sails in a following wind and made good progress in a portion of the river which has a slack current. Probably the camp for this night was slightly upstream from the place where the river widens and flows about several large islands. This is about 20 miles downstream from present Norman Wells. Mackenzie does not mention the spectacular view of the nearby Norman Range. It is suggested that much of the detailed description of country may have been deleted from the published journal especially as it was written ten years after the voyage.

Friday, July 31, 1789. Unsettled weather of the preceding days lasted throughout the night, but it subsided at nine o'clock so that the party was able to continue the journey. Fortunately the favourable wind (blowing upstream) continued as well, at least until late in the afternoon when skies cleared and wind dropped. Mackenzie had intended to keep close contact with the western shore of the river in the hopes of discovering a large tributary from the west. But through this part of the river, shoals near the west shore prevented a close approach. The reference to shoals, however, is helpful in fixing the sector of the river passed on this day. Opposite Norman Wells and for some 10 miles downstream and intermittently upstream, the west bank is difficult to approach because of sand and gravel bars. In the cut banks or where recent slumping had occurred, Mackenzie observed ground ice which existed to within a foot of the upper surface. Permafrost sustaining ground ice is continuous only locally in this part of the river valley (Brown, 1960). The long day, for they camped just before eight o'clock, probably meant an additional thirty or so miles nearer their destination, which would place the possible campsite somewhere in the vicinity of Ten Mile Island, ten miles above Norman Wells.

Saturday, August 1, 1789. Mackenzie continued his journey at three o'clock in the morning and it appears that he kept to the west side of the river most of the day. They encountered one group of Indians, but as the menfolk were away hunting, no further information concerning the western river was forthcoming. Mackenzie suspected this was in part because his interpreter

withheld information since it might induce a decision to follow another course instead of returning to Fort Chipewyan. That night they crossed the river and camped under Bear Rock and occupied the same campsite as that used on the 5th of July. This was the first night that the sky was dark enough to see the stars.

Sunday, August 2, 1789. The wind having changed, the men were forced once again to revert to the tow-line. In a short time they came to Great Bear River and noted mineral springs near Bear Rock and lumps of what Mackenzie believed to be iron ore. The Indians he had expected to meet at the river were not present, and he continued upstream believing the smoke he observed to be from native camps. He discovered, however, that the smoke was from fires burning deep in lignite seams along the east bank. Perhaps, his iron ore was some of the reddish residue from these burns. Smoke from these fires was observed on subsequent explorations by Franklin and Richardson, and modern day travellers may see the smoke occasionally for evidence of the fires erupt intermittently. Possibly this is why Mackenzie failed to notice or record the phenomenon on the downstream journey. Farther upstream, there was evidence of recent native habitation and the group made their camp nearby. Later in the day Mackenzie sent his men in search of local Indians but the search was frustrated when the men encountered a large lake inland from their camp. There are two large lakes near the bend in the Mackenzie River ten miles upstream from Fort Norman. The camp could have been near this place.

Monday, August 3, 1789. During this and the next seven

days Mackenzie and his party pursued the upstream course from Bear River to Camsell Bend. It is only possible to estimate the daily distances accomplished by matching the time of travel against the total distance and considering the river current characteristics. There are some small hints in the journal to help give some slight indication of the explorer's progress.

This particular day must have been an arduous one, for it certainly was a long one. The group began to travel at four o'clock in the morning and about noon they probably reached Old Fort Point. It was at that time of the day Mackenzie noted the current of the river had increased, and this occurs near Old Fort Point. They continued to tow the canoes along the east bank to avoid the serpentine passage of the west shore. It is likely too that the day, which ended 16 hours after the morning start, brought the party above the confluence of the Keele or Gravel River.

Tuesday, August 4, 1789. After a cold night, Mackenzie and his men worked upstream along the gravel strewn beaches against the strong current characteristic of this island-dotted and shoal-strewn part of the river. They camped at five o'clock in the evening and probably settled for a narrow beach between the Dahadinni and Blackwater Rivers.

Wednesday, August 5, 1789. The journal entry gives no indication of their geographic location. Mackenzie mentioned that they proceeded with great difficulty, and we may assume that 25 miles by tow-line would be good progress. They might have reached a point about the mouth of Johnson River.

Thursday, August 6, 1789. Rain delayed departure until after six o'clock in the morning, but then a shift in the wind to a favourable quarter permitted the men to forego dreary trudging along the river. Instead, hard paddling and sails were used to stem the current. The section of the river over which they passed is one which is narrow and deep, although the current is slack. Under these circumstances they might have passed the site of Wrigley before camping at six in the evening. Mackenzie failed, however, to mention Roche-qui-trempe-à-l'eau which is an obvious landmark opposite Wrigley.

Friday, August 7, 1789. Although not stated outright, the journal account gives the impression that the men were towing the canoes once again. The section of river between Wrigley and River-Between-Two-Mountains, more particularly near the latter, is one which has a fast current and is compatible with Mackenzie's description of currents "along the points" being "equal to rapids." (Mackenzie, 1902, p.312). Daily progress was much reduced by fast water and the toil of scrambling over stone-covered beaches below the high banks. They camped that night "at the entrance of a small river" (loc. cit.). The two shreds of evidence, fast water and the river mouth, suggest that the camp-site might have been at River-Between-Two-Mountains.

Saturday, August 8, 1789. Mackenzie and his party remained at the same camp throughout this day to allow his hunters to replenish the food supply. Moreover, the weather was bad, and unfavourable for travel.

Sunday, August 9, 1789. The rainy weather of the preceding

few days brought a rise in the water level and a stronger flow against which Mackenzie's men had to march. They pushed on upstream, beginning at half past three in the morning and continued until seven at night. During the day, the party would have passed the southern end of the mountains which rise on the eastern side of the river. Mackenzie did not acknowledge the existence of Willowlake River and as he had done in the downstream journey. He may have missed it altogether by passing along the western channel around McGern Island. Probably the group camped in the vicinity of this island.

Monday, August 10, 1789. From his first receipt of word concerning the river to the west, Mackenzie was unable to amplify this intelligence by native description or by his own observations. Therefore, as the mountain chain to the west and the great river became closer to one another, he planned to climb the slopes of the Camsell Range for a good vantage point from which to survey the country side. Accordingly, Mackenzie landed the canoes on the west side at Camsell Bend and with an Indian companion hiked toward the peaks. The excursion was a failure because swampy ground lying between the mountains and the river prevented him from gaining his objective. Once again the poorly developed drainage of the valley floor was an obstacle to exploration back from the river.

Tuesday, August 11, 1789. Throughout the day Mackenzie made every effort to meet some of the local natives. They had seen none since they left the Ramparts and he wished to learn more of the western river. In the passage upstream, they worked from the

west to the east bank and back again, spending several hours tracking natives along the shore. At the same time, Mackenzie was getting less and less co-operation from his own party, and from the English Chief in particular. They continued to fear that Mackenzie might lead a side excursion to find the fabled river instead of returning directly to Fort Chipewyan. The camp-site was probably some twenty miles upstream from the North Nahanni River mouth.

Wednesday, August 12, 1789. To make an efficient search of both sides of the river, Mackenzie directed two of his Indians to follow the south shore. The remainder kept to the north bank looking for local inhabitants. The day passed and no Indians were seen. The group camped early at a site which is not identified in the journal. Judging from previous distances, however, the camp might have been another 25 miles upstream from the last site.

Thursday, August 13, 1789. With an early start at 3:30 a.m., they pushed on upstream and noted several places occupied by Indians. During a stop at an island they retrieved the cache which was left on the downstream journey on the first of July. That night the group camped at the mouth of the Liard River, probably on the flats below the island upon which Fort Simpson is built. At this time of the year the low water level exposes extensive shoals along the south side of the river and around the island, which Mackenzie observed to be covered with a whitish salt deposit.

Friday, August 14, 1789. Before continuing upstream, Mackenzie examined the mouth of the Liard River by travelling a

few miles upstream and across and back down. He was moved once again to mention the muddy water of this river, and now was aware that the two streams did not blend immediately, but continued to flow side by side for some miles downstream of the confluence. Mackenzie did not seem to appreciate that the Liard could be the river leading through the mountain ranges to the headwaters of the Yukon River. Instead he abandoned the mouth after a cursory examination. Upstream from the mouth of the Liard, the Mackenzie River is confined to a narrower channel and flows more swiftly. Walking over bouldery beaches at the base of high banks must have been difficult going and progress was probably arrested for the night near the mouth of Rabbitskin River. Working from the Liard River, it seems reasonable that the party remained on the southwest side of the river after having visited the Liard River. Mackenzie did observe a river entering from the opposite side which appeared navigable, which was likely the Rabbitskin River.

Saturday, August 15, 1789. The whole of this day was spent hauling the boats upstream against the strong current. The camp for this night was probably about ten miles below the Head-of-the-Line.

In the cold early morning hours Mackenzie's group once again took up the tow lines and proceeded slowly along the narrow beach, and reached the Head-of-the-Line within a few hours. Here the widening of the river is accompanied by a slack current. Now they were able to use paddle and "proceeded upon it (current) almost as fast as in dead water" (ibid., p. 323). No mention is

made of their campsite, but it was probably some miles upstream from Trout River although it is not mentioned in the Journal. Also, it might have been on the north bank which is less swampy and has deeper water inshore than most portions of the south side of this section of the river.

Monday, August 17, 1789. Progress upstream during the day was at a much reduced pace because they had to work against strong and swift-flowing water. The length of the working day, however, was typical of Mackenzie's perseverance. From half past three in the morning until seven in the evening they paddled on, noting, among other things, several Indian lodges which, from their structure, Mackenzie took to be those of the Red-Knife Indians. The evening camp was at a familiar location, the same one at the outlet of Mills Lake occupied on the night of June 29th.

Tuesday, August 18, 1789. In the early morning Mackenzie ventured out across Mills Lake from his camp on the southwest edge. The land on the north side is low and swampy, and the lake itself is quite shallow away from the main river channel which crosses the southern end of the lake. Here he observed the latitude as $61^{\circ}33'N$. which is only a few minutes north of the true position. Once on the north side of the lake, they canoed southeast. The subsequent course likely took them along the east side of the lake, past a small channel mouth, and camped on one of the islands north of the main stream of Mackenzie River. The Indians from the exploring party were forced by low supply of provisions to devote time to a hunting excursion, so that no

effort was made to cover a great distance.

Wednesday, August 19, 1789. It is difficult to reconstruct Mackenzie's course on this day, but it is clear that he continued to delay progress in favour of hunting expeditions. Presumably his own travel, only four hours, was along the island-studded channel upstream towards present Fort Providence.

Thursday, August 20, 1789. Beginning to move at four o'clock in the morning, the party kept to the north side of the river and passed the present site of Fort Providence. The strong current on this side was tolerated so that Mackenzie might observe the mouth of the Horn River which he knew from the early part of the journey to be somewhere in the vicinity. Soon he concluded correctly that the channel he passed on the preceding Tuesday must have been Horn River. He then crossed to the south side and experienced the stronger current of the Providence Rapids. At half past seven they camped on the north side of the river where the banks are low, about 20 miles upstream from the rapids.

Friday, August 21, 1789. Bad weather, including a strong wind from the east and rain, prevented the group from moving the boat. Therefore, Mackenzie remained in camp while his hunters searched the neighbouring forests.

Saturday, August 22, 1789. When the storm passed the wind veered to the west and enabled the group to employ sail which carried them swiftly. They reached the edge of Great Slave Lake in three hours via the north channel, a journey Mackenzie said would have taken eight hours to paddle. Strong wind and rough water prevented him from proceeding out onto the lake. They were

poised, however, to return across Slave Lake by the north shore, then across to the Slave River and eventually to Fort Chipewyan.

The following day, Alexander Mackenzie left the great river which would eventually bear his name, but to him it was the River of Disappointment. He had spent a total of fifty-five days on its course, two weeks following it downstream to the sea, and the remaining thirty-one days making slow and arduous progress against the current back to its source. Although disillusioned by finding a river which emptied only into an ice-filled sea, he brought some hope of a successful route to the Pacific. It was this hope which Mackenzie harboured and for which he prepared himself.

THE EXPANSION OF THE FUR TRADE INTO THE MACKENZIE REGION

1789 - 1850

After Alexander Mackenzie's epic journey to the Arctic Ocean, exploration of the region drained by the Grand River consisted in the first place of effective occupation of the valley by fur trading posts of the North West Company. In this way a body of knowledge concerning the geography and inhabitants of the valley was gradually accumulated by the men who were the traders along the river.

Their reports, from which we must piece together the way of life as it was, dealt mainly with that part of geography related directly to the prosecution of the fur trade.

North West Trading Posts.

Events in the three years preceding Alexander Mackenzie's journey to the Arctic set the stage for traders to take over the Mackenzie region. Already a fort, Fort Resolution, was established on Great Slave Lake, and Fort Chipewyan, later to become the master depot, had been built on Lake Athabaska. Even the independent traders had joined forces in the North West Company of 1787. Roderic McKenzie, the cousin of Alexander Mackenzie, started trading at the outlet of Great Slave Lake in 1790 where he discovered the fishery which was to sustain the success of the North West Company, and the Hudson's Bay Company after, for many years. (McKenzie, 1889, p.36). Possibly this post became known as Fort George shown in Wentzel's map of 1822. (Wentzel, 1822). The locations are just about the same. The post of Lac la Martre was reopened, probably in 1793, and the Dogribs were encouraged

FUR TRADING POSTS UP TO 1850

+ REPRESENTS OLD FORT



to trade as middlemen with the Hare Indians to the north. (Wentzel, 1889, p.95). No posts were built on the Mackenzie River proper until 1796 when a clerk named Duncan Livingston began trading on the right bank of the river a short distance downstream from the mouth of Trout Lake River (loc. cit.) In the interval of 1790-1796 the new company was busy consolidating its gains in the Athabaska region, and Alexander Mackenzie had explored overland to the Pacific Ocean. The Grand River still remained on the periphery of trade development largely because of the length of time it took to bring supplies to the region and return with the furs. Such a long journey depended upon speed to be accomplished in a single season, and the canoes had no time to hunt game for food. Instead there grew up a system of trading and storing of dried meat and rendered fat which when mixed was pemmican. Thus while it may have been easy to extend trade to the backward forest Indians of the northwest, it was not so easy to engage in trade for dried meat with the superior and independent people of the plains. The buffalo gave them all that they needed for comfortable living. Faced with such independence the North West Company resorted to the same inducement which they used when faced with competition - liquor. Gallons of spirits were trundled west to break the independence of the Plains Indians. Gradually the pemmican trade and the fur trade became integrated and the North West Company was on the threshold of a profitable exploitation of almost the whole northwest, except for the territory in the immediate environs of Hudson's Bay where the "English" operated.

Within the North West Company itself the same problem of distance gave rise to two classes of partners; on the one hand there were the winterers who remained in the country and had intimate knowledge of the conditions and problems of dealing with natives. On the other hand, there were the agents in Montreal who were business men concerned with financing quantities of credit and obtaining supplies. It is not difficult to see how these two groups could drift apart, and this happened from 1787 onwards. In the course of several agreements - the North West Company never had a charter - the partnership was enlarged and some partners left the coalition to operate on their own. These independents later became the nucleus of another powerful rival that invaded the Mackenzie region.

Duncan Livingston in his Trout Lake River post was quite successful for three years when in 1799 he undertook to repeat Mackenzie's journey to the sea in search of silver which was reported. It is possible that the journey was also to begin another post in the north for a house was erected for trade at the outlet of Great Bear Lake in the same year (Franklin, 1828, p.291). When the party were beyond Arctic Red River they fell in with Eskimos who killed Livingston and his group. For a time one James Sutherland escaped but was caught and drowned by having a stone tied to his neck, and being dropped in the river. (Wentzel 1828, pp.78-79). The next year John Thompson, Livingston's replacement, abandoned the Trout River post and divided the Mackenzie River Indians between two posts. One was the Great Bear Lake post (later called Fort Franklin) and the other was

the new Rocky Mountain Fort on the right bank opposite the mouth of North Nahanni River. (Wentzel, 1889, p.95; Voorhis, 1930, p.150). By this time the rivalries and discontent among the winterers had given rise to the strong company in opposition to the North West Company. The New North West Company, known as the XY Company and later Sir Alexander Mackenzie and Company, had behind it Alexander Mackenzie whose overall views and experience in the country contributed a great driving force. With the publication of his Voyages in 1801 and the subsequent knighthood, prestige was lent to their efforts. Competition in the northwest increased activity along the river and gave rise to a multiplication of forts in the Mackenzie region.

In 1803 there were still only two main North West Company posts, but the Rocky Mountain House had probably been replaced by a fort at the "Forks" or the confluence of Riviere aux Liard and Mackenzie's River (Innis, 1956, pp.201-202; Masson, 1890, p.27; Hunter, 1953, p.16). In 1803-4 the XY Company had four posts on Peace River to the Northwester's five, and they were on the Mackenzie River and next year if not before (Morton, 1939, p.517). In 1804-5 there was opposition at Great Bear Lake because the master of the North West Company fort there was killed in a dispute over Indian allegiance (ibid., p.518). New posts were built at Fort Liard on Liard River, and Fort Good Hope on the left bank at Blue Fish Creek (Hare Indian River) just below the Remparts. (Innis, 1956, p.202; Wentzel, 1882, plate XVII).

In this early period, expansion into the southwest via the Liard River took place and Fort Nelson, likely named for England's

naval hero, was founded. The probable site was at the Forks of the Nelson and Liard rivers, rather than at the present site up the Fort Nelson River. Some subsequent remarks made in the district refer to the old Fort Nelson at Liard River (H.B.Co. Reports on Districts, Mackenzie's River, 1829, p.6). The usual date for this port is about 1800. (Voorhis, 1930, p.124). About this time Lord Nelson was becoming famous in England and no doubt news of his exploits filtered out to the northwest. The Battle of the Nile, 1798, may have been sufficient claim for the naming of a fort in his honour about 1800, and Nelson was certainly famous after Trafalgar, in 1805. It is suggested that Fort Nelson was built about 1807 after such news could have reached the Mackenzie region. Besides, it seems sensible that Fort Nelson be built after Fort Liard rather than before.

The North West and the X.Y. Companies.

The period of fierce competition between the Northwesters and the XY Company was from 1800 to 1804, and then the two concerned submerged differences to resume a united approach to the fur trade. It may well have been during this period that many more forts or posts were built along the Mackenzie River. The map in Franklin's Narrative of a Second Journey to the Shores of the Arctic (1828) shows a number of "Old Forts" and Wentzel's map (1822) does likewise. Perhaps Fort Castor dates from this period. An old fort near Fort Simpson was probably one built during the opposition period and another establishment opposite Livingston's Fort on the left bank of the Mackenzie is of similar vintage. Old Fort Alexander is shown by Wentzel at the

mouth of Willowlake River which was possibly named after Alexander Mackenzie, but whether it was during his time with the XY Company or the North West Company, it is not possible to say. There was also another fort at the mouth of Carcajou River on the left bank built sometime in the early 1800's. Richardson makes note of an old fort on the right bank of the Mackenzie River just above the mouth of the Dehadinni River (Richardson, 1852, p.116). This on Wentzel's map in 1822 is Fort Normand. Fort Norman dates from about 1810, although it may have been established about the same time as Fort Good Hope 1804, otherwise the latter fort would have been separated by more than 450 miles from the main post at the Forks (Fort Simpson), without any intervening establishment (Robinson, 1946, p.9). The site shown by Wentzel on his map in 1822 was an old site chosen by the North West Company.

The period after the North West Company had united with the XY Company in 1804-5 until the final merger with the Hudson's Bay Company was one of intense competition in many regions, but the Mackenzie region was largely untouched. Generally the Athabaska country - from Methye Portage through the entire north-west drainage - was not an area of Hudson's Bay competition, and although they succeeded in having posts in the region, the Northwesters continued to monopolize the trade. In 1810 rabbits, a substantial source of food in the district, failed to appear and starvation led to eating of many of the furs destined for trade (Wentzel, 1889, p.106). This considerably reduced the returns of the district, and its continued operation was

economically precarious in the face of competition elsewhere. Besides the war in 1812 threatened supply lines. As if to add further insult, the Indians attacked and destroyed the Fort Nelson post during the winter 1812-13 and massacred the inhabitants (Keith, 1890, p.125). This post was abandoned, probably in retaliation as much as in fear of repetition of the incident. It appears that pressure of competition forced the withdrawal from the whole Mackenzie region in 1815. Wentzel writes: "By this time the concern (North West Company) conceiving the department (Mackenzie River) incapable of defraying the expenses ordered it to be evacuated altogether, which was accordingly done in the summer of 1815 to the great hazard of our lives, for the natives having obtained a knowledge of our intentions had formed the design of destroying us on our way out."

"Notwithstanding that no promises had been made of returning at a future period to trade with them, I was sent the following summer with six Canadians in a large canoe and a small supply of goods to renew the intercourse. In the course of my passage down the river as far as Fort Good Hope I fell in with several parties of all the different tribes and was welcomed with such extravagant demonstrations of joy. They danced and cried by turns, rushing up to their knees in the water to pull my canoe ashore, begging at the same time that the whites would return to this land and promising their utmost endeavours to render our situation with them as comfortable as possible ... I undertook to make a report of their request and advised them to hunt fur and prepare provisions in the expectation that it would be granted; I also

assured them that if we did not resume our deserted establishments a canoe would certainly go down every year to trade their furs and bring them the most useful supplies. This pacified them and they agreed to exert themselves in collecting peltries." (Quoted in Innis, 1956, pp.274-75.). The North West Company returned to the Mackenzie district in the summer 1818 so as not to let this region pass to the Hudson's Bay Company by default (Wentzel, 1889, p.123). They then resumed trade at The Forks, Fort Liard, Fort Norman, and Fort Good Hope. The post on Great Bear Lake was not reopened, although the people from Fort Norman may have gone there for fishing in the winter.

Outside the Mackenzie River district the strong competition with the Hudson's Bay Company increasingly put pressure on the Northwesters and demonstrated the inefficiency of the long over-land trade from Montreal compared with the shorter routes via Hudson Bay. This was early recognized by Sir Alexander Mackenzie and while he was alive he never ceased to urge the North West Company towards that end (Campbell, 1957, p.165, *passim*). He even tried to gain financial control of the Hudson's Bay Company, and although he was refused, the thoughts of union were planted in official minds. Sir Alexander, unfortunately, died in March 1820, before the two great fur trading companies united under the name of the Hudson's Bay Company on March 26, 1821. (McKenzie, 1889, p.57; Innis, 1956, p.280).

The Hudson's Bay Company

The agreement of union meant monopoly control of the fur trade not only in the Mackenzie basin where the Northwesters

had the monopoly beforehand, but over the entire northern half of North America. This brought about, of course, many changes in the conduct of the trade which would make it more efficient, and ultimately more profitable to the shareholders. One obvious improvement was in the transportation routes and Montreal dwindled from this time onward as a supply centre for the north-west trade. The location of the post at the Forks was strategically sound and it continued to function as the distributing point for other Mackenzie River and Liard drainage posts. This led to it becoming the administrative centre of a separate Mackenzie River department. In 1822 at The Forks there began the construction of an entirely new post a short distance north of the old North West Company establishment. W.F. Wentzel was in charge of the construction work.

During the winter 1822-23, Chief Trader A.R. McLeod received a letter from the new Governor, George Simpson, indicating that some of the changes in the Mackenzie River department should include exploration of the tributary streams of the Grand River. (Patterson, 1961, p.40). Natives were known to live in the mountains west of the Mackenzie River but no one had made contact with them for the purposes of trade. McLeod took a month long journey to seek the Nahani Indians but returned on March 9th 1823, without having encountered the mountain people (H.B.Co. Journal of the Forks, Mackenzie's River, 1822-23). When the ice broke up in the spring a better equipped expedition started out for the same country under J.M. McLeod on June 5th (loc. cit.). They found it difficult to ascend the South

Nahanni River which was swollen with spring melt and so they cached the canoe and headed overland (Patterson, 1961). All the time McLeod kept to the ridge tops in search of smoke which would indicate native camps. They walked west to a tributary of the Flat River and being without success began to return. Fortunately they encountered a small band of the Nahani Indians in the vicinity of the La Biche Mountain Range, and with gifts encouraged them to hunt furs for a meeting with the whites the next year. McLeod arrived back at the Forks on 10th July. (H.B.Co., Journal of the Forks, Mackenzie's River, 1822-23).

In the same summer of 1823 Fort Good Hope was removed to a site downstream on the left bank of the Mackenzie at the confluence of Trading River. This was at the request of the Loucheux people who were unused to making the long journey upstream. (H.B.Co., Reports on Districts, Mackenzie's River, 1825, p.6). With this shift of the post some accommodation had to be made for the Hare Indians normally supporting Fort Good Hope. Accordingly, Fort Norman was also moved downstream to a site on the west side of the Mackenzie River 30 miles above the mouth of Great Bear River (ibid., p.5). This would place it just below Old Fort Point thought to be the location of old Fort Castor (H.B.Co., Journal of the Forks, Mackenzie's River, 1822-23; July 30, 1823).

In addition to exploration and the relocation of posts, the new Company inaugurated the use of "boats" presumably not unlike the boats they employed on the Saskatchewan - on the Mackenzie River (H.B.Co., Folio A/12/1, p.87). There was also to be

some tightening up of the tariff in the trade so that the price of goods would be reduced but there would be more uniformity in treatment of the natives from post to post, and also it was expected to help the Indians reduce their debts to the Company (ibid., p.86).

J.M. McLeod returned to the Nahani country in June 1824 and covered about the same ground as in the previous journey seeking out these Indians. He finally found them and brought them to Fort Simpson to initiate trade connections (Patterson, 1961, pp.44 ff). Murdock McPherson at Fort Liard sent his Indians in 1823 to trade upstream on the Liard River and they probably reached the Liard Plain. McPherson himself went about 100 miles upstream in 1824 (H.B.Co., Reports on Districts, Mackenzie's River, 1825, p.4). Thus it was that the southeast portion of the Mackenzie region was reasonably well known to the traders from access via the Mackenzie and Liard Rivers, and also from Great Slave Lake. Besides they had all the Indians in this quarter trading at the Hudson's Bay Company posts. Exploration was needed at the north end of the district.

The northern part of the region was occupied by the Eskimos who were known to the traders only through the Loucheux Indians. Eskimos had promised to come from the coast to trade at Good Hope, but none ever got up above Arctic Red River in the first year of the operation at the new site. It seems as if the northern location for Fort Good Hope didn't work out well. The Loucheux Indians failed to support the post in the manner which was anticipated, and there seemed no immediate prospect for

trade development with the Eskimos. Captain Franklin, returning from the coast in 1825, confirmed the notion held by the traders that the Eskimos were altogether hostile to the whites, and besides, there were no furs worth bothering about on the tundra. The upshot of these circumstances was that Fort Good Hope was removed back to the old site at Hare Indian River probably in 1826 or early 1825. (H.B.Co. Reports on Districts, Mackenzie's River, 1823-27, pp.4-5). The post possibly was rebuilt on Manitou Island in the Mackenzie River opposite the mouth of Hare Indian River instead of on the left bank where it was up until 1823. There the post remained until the spring flood in 1836 washed away the entire establishment and Trader Bell and his men escaped with only their lives. Good Hope was then rebuilt on the right bank at its present site. (H.B.Co., B.200 b.9, p.1). By 1829 there was another fort on the Liard River named Fort Halkett in honour of one of the committee men of the Hudson's Bay Company. (H.B.Co. Folio A/12/1, p.343). The site was "at the mouth of Buffalo River" on the Liard. The location of the post is difficult to fix since no rivers now are called Buffalo. (loc. cit.). In other reports the site is described as being on Red Deer River which may be coincident with La Biche River some thirty miles upstream from Fort Liard. (H.B.Co. Reports on Districts, Mackenzie's River, 1829, p.6). This seems unlikely, but wherever the original location was, it was removed to a place deemed strategic for Nahani Indians at the mouth of Smith River, probably about 1832, (H.B.Co. Reports on Districts, Mackenzie's River, 1833, p.26). Gradually the Mountain Indians were

encouraged to use this place instead of making the long journey to Fort Liard.

Fort George at the source of the Mackenzie River was likely maintained as a fishing station until the 1830's. No mention of it as a fur trading place is to be found since its early founding. Instead, about 1830 Big Island became important as the fishery directed by Fort Simpson (Voorhis, 1930, p.50). It was possibly the successor to Fort George. The repeated success of the fall run of whitefish at the east end of Great Slave Lake provided a stable element in the provisioning of the district and each year some of the engaged men of the Company fished on the south side of Big Island in summer and on the north side in winter (Richardson, 1852, p.101). Big Island post did some trading off and on, but generally functioned as an emergency supply station rather than a regular post.

More exploration work by the Company men occurred in 1831 when J.M. McLeod was commissioned to trace the Liard drainage to the interior and cross over the divide to Pacific streams at the mouths of which Russian traders were known to operate. (H.B. Co. Folio A/12/1, p.390). He followed up the Liard until the forks, and then along the south branch or Dease River, over across the divide to the Stikine River, mistakenly named Pelly River at that time. The journey was reported to be 500 miles above the forks of the river. (ibid., p.455). A notion arose that Fort Halkett could be removed to this farthest extent so as to drain away the Russian trade. With this in mind McLeod went again to this country in 1834, and indeed it may have been on

this trip that he reached his furthest point; in any case John Stuart, the Chief Factor of Mackenzie's River, was of the opinion that McLeod's journey would become far more important than either that of Captain Parry or Captain John Franklin! (H.B.Co., Reports on Districts, Mackenzie's River, 1834, p.35; Morton, 1939, p.706). This initial penetration westward was to be followed up by Hutchison in 1836, but a rumour that the Coast Indians were about to attack sent him retreating in haste. A.R. MacLeod (Jr.) and Robert Campbell went to Dease Lake in the summer of 1837 with the intention of removing Fort Halkett to that place. Campbell apparently followed McLeod's trail and ascertained that the river to the coast was the Stikine instead of the Pelly. Here he was menaced by the Chilcat Indians of the coast because they regarded him as a direct threat to the lucrative middlemen trade they operated between the Russians and other mountain Indians. Campbell remained for the winter of 1838-39 in this country but his hunt for provisions proved fruitless and even the fishery was a failure so that all season they were on the verge of starvation. (Morton, 1939, p.707). Nothing remained but to abandon this post and return to Fort Halkett. From Halkett Campbell explored the north branch of the Liard River and followed up Frances River, named for the wife of Governor Simpson, to the lake of the same name. Beyond the lake, Campbell crossed the divide to come down into the headwaters of Pelly River. Having found a river heading north, he returned to Fort Halkett to report these things to Fort Simpson and ultimately to Governor Simpson. (ibid., p.708). The Governor was delighted

with these discoveries. The description of a vast new beaver land of the Liard Plain - McLeod had taken 100 beavers without even hunting them! (H.B.Co., Folio A/12/1, p.456) - and the fur wealth which Campbell reported from Frances Lake in addition to a hopeful prospect along the still unchartered Pelly River would be good news to the Company directors.

Exploration was also taking place in the summer of 1839 along the Peel River (H.B.Co., B.200, b.12, p.3). There was some consideration given to going up the Arctic Red River in an attempt to cross over to the headwaters of Peel River, but the advice from the Indians discouraged this plan in favor of entering the Peel at its mouth (H.B.Co., B.200. b.11, pp.15-16). John Bell performed this trip but his account is difficult to follow. He did penetrate the river a good distance, at least 100 miles, and possibly further. He did get into the edge of the high Peel Plateau. (H.B.Co., B. 200. b.12, pp.3-4). The result of the journey was the establishment of the post called Peels' River, but later known as Fort McPherson and named after the Chief Factor Murdock MacPherson then in charge of the district. This was in the summer of 1840. (ibid., p.10). A year later the winter road direct between Fort Good Hope and Peel River (McPherson) was blazed with the aid of an Indian guide, and the next year, 1842, Bell made his way up the Rat River discovering the pass across the Richardson Mountains to Bell River. La Pierre House, probably built a year or so later, stands on Rat River and was to become an important relay point for the trade penetration into the Yukon drainage. In the summer of 1843,

A. McBeath attempted to ascend the Gravel River (Keele River) but he did not get very far before he realized that it would not prove a significant link in the fur trade transportation routes (H.B.Co., B. 200 b. 19, pp.32-35). John Bell, from Fort McPherson, was not able to pursue his earlier discovery to the western divide until 1846, when he reached the Porcupine River and followed it downstream to the Yukon River. The next year Alexander Murray built Fort Yucon at the junction of Yukon and Porcupine Rivers where he was greeted enthusiastically by the natives in the heart of Russian trade territory! (H.B.Co., B. 200 b. 22, pp.15-20).

Meanwhile Robert Campbell working from the Liard drainage had already entered the Yukon basin, but the scarcity of game in the country of the upper Liard during the early 1840's delayed his plans to follow his discovery. Finally, in the early summer of 1843 Campbell left the Fort at Frances Lake, built the previous year, crossed over the divide to the rude house at Pelly Banks which he erected during the winter. In the spring he continued downstream, locating and naming the MacMillan and Lewes Rivers, the latter after John Lewes in charge of the district. His men refused to go further, and reluctantly, Campbell returned to Frances Lake arriving before the end of July (H.B.Co., B. 200, b. 19, pp.8 ff.). In the next few years this route became better known and was loudly supported by Campbell as the most useful access to the Pacific coast, against the judgment of Chief Factor James Anderson newly in charge of the Mackenzie River district (Innis, 1956, p.324). Campbell's

energy eventually proved the undoing of his arguments, for in 1851 he followed the Pelly and Lewes Rivers downstream to find he was actually on the Yukon when he was greeted at Fort Yucon by Trader Murray. He returned via La Pierre House further proving the superiority of the Peel River access to the interior (H.B.Co., B. 200, b. 26, pp.6,7). Fort Frances Lake, no longer strategically useful, was abandoned in the autumn of 1851 (ibid., p.8). The other posts on the upper Yukon established by Campbell fell victim to difficult transport soon afterwards. (Innis, 1956, p.24).

By the early 1850's, the crude outlines of the Mackenzie drainage and its association with neighbouring drainage basins was quite well known to the Company. What areas they had not explored themselves were reasonably well described by the natives who knew them. There seemed no reason why further expense should be incurred to embroider with additional detail what was already sufficient to the profitable prosecution of the fur trade. There was still one portion of the region which was imperfectly known from the trade point of view - the land of the Eskimos. The Company had, however, the reports of Captain Franklin and Dr. Richardson upon which to base judgment about the establishment of trading facilities among those people. They had also the reports of their own men, Thomas Simpson and Warren Dease, who succeeded in completing the gap in the coastal chart east of Mackenzie River. Dr. John Rae of the Hudson's Bay Company made his own special contribution to exploration in the company of

Dr. Richardson in 1848-49. But these surveys were in the interests of geography and not in the interest of trade, and their story is told separately.

The period from Mackenzie's journey until the 1850's in the Mackenzie Region passed from exploration to violent competition for trade, at first between the original North West Company and the XY Company, and later to a lesser extent between the North West Company and the Hudson's Bay Company. This period was followed in 1821 by a merger of the two into the Hudson's Bay Company. These events led to a proliferation of trading posts which were later abandoned in a process of trial and error during which the organizing of the resources of the district was adjusted to the efficient ways of the fur trade. By the 1850's the pattern for future development was set.

GEOGRAPHICAL EXPLORATION IN THE FIRST HALF OF THE
19th CENTURY

Fur traders were explorers but they were also settlers. The records of their exploits rarely came under public scrutiny and public recognition of achievements touched only a few of these men. Most of the adventures they endured were for the extension of trade and not for the simple knowledge of where a river led or the configuration of the coast. This latter type of exploration is geographic and, at first, it was not of immediate concern to the Hudson's Bay Company.

The geographic exploration was sponsored in the beginning by the British Government in an effort to discover the passage by sea to the northwest. This activity would also give profitable employment to many naval officers and men newly released from military need by the close of the war with Napoleon. The Government knew that the Grand River, or as it soon became, Mackenzie's River, was already developed as a highway into the heart of the Mackenzie Region by active exploration of the traders, and it meant to take advantage of this lead to attack the Northwest Passage from the interior. Captain John Franklin, R.N., arrived in the Mackenzie Valley just before the end of the fur trade rivalries that brought twenty unsettled years following Mackenzie's journey to the Arctic Sea.

Franklin's First Expedition 1819-21.

Lt. Franklin - he had not yet been promoted to Captain - under orders from the British Government was sent to explore the northern coast of the continent, particularly the unknown stretch east of the Coppermine River. His route was to be accurately surveyed and additional scientific information gathered. With the co-operation of the Hudson's Bay Company and the North West Company, Franklin made his way via the Hudson's Bay route along the chain of posts up the Saskatchewan River and eventually to old Fort Providence on Great Slave Lake. In the company of Dr. John Richardson, Midshipman George Back and Midshipman Robert Hood, Franklin left Providence on July 18, 1820. Although he planned to descend Mackenzie's River and enter Great Bear Lake on his way to Coppermine River, he was persuaded by his Indian guides and hunters that the route through a chain of lakes from the headwaters of Yellowknife River was better supplied with game. The interior route to the sea gave Franklin the chance to observe the character of the upper Mackenzie drainage and its inhabitants. He recorded for general distribution the first account of the region. (Franklin, 1823).

The journey of discovery was accomplished mainly during the summer of 1821 when the party explored east from Coppermine River to Bathurst Inlet. The return trek to Fort Enterprise across the barrens in the late fall and early winter is a tale of starvation, suffering and loss of life. Midshipman Hood was murdered. Others of the supporting voyageurs died of starvation and exposure. Franklin, Back and Richardson fortunately were

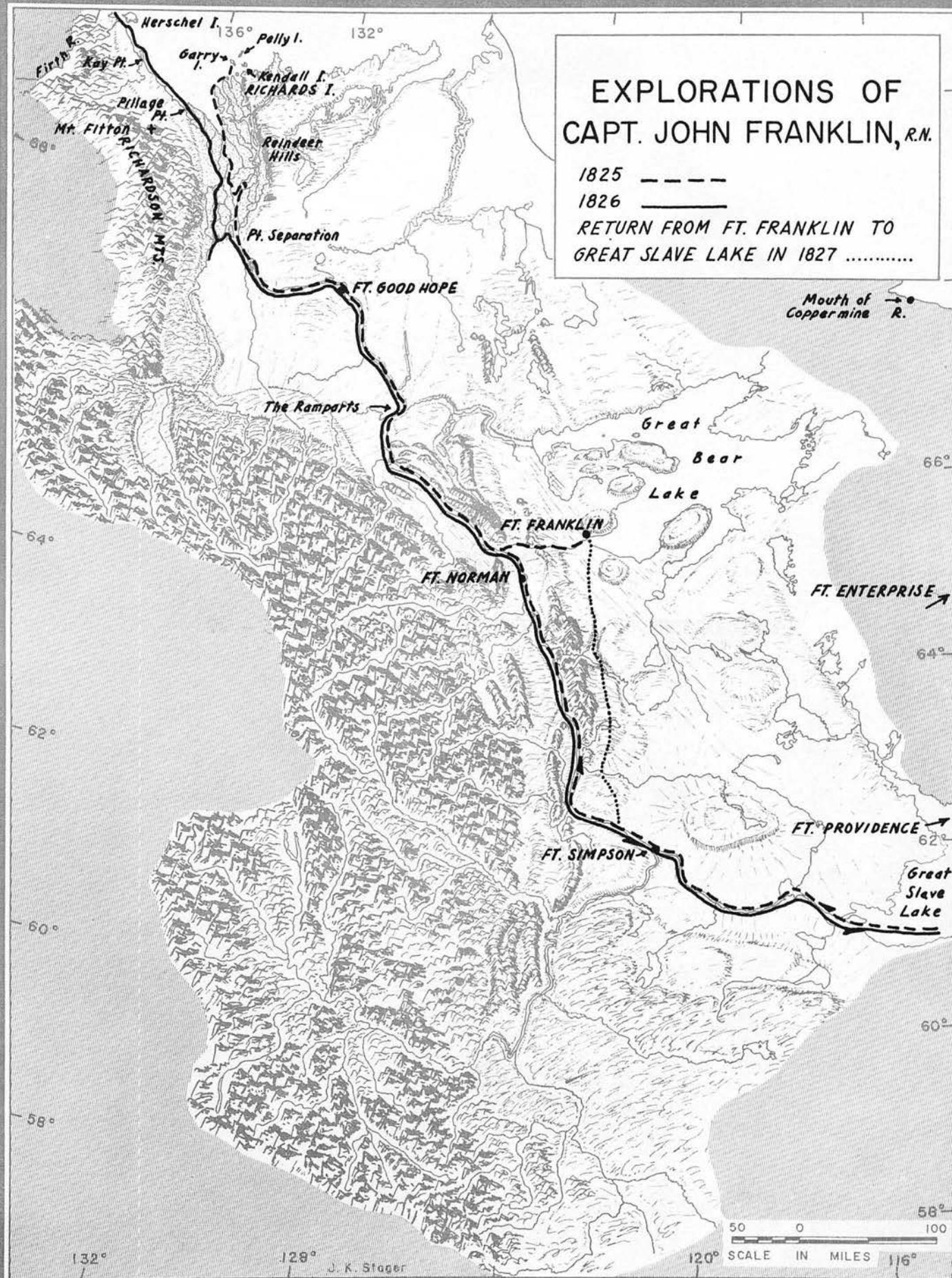
EXPLORATIONS OF CAPT. JOHN FRANKLIN, R.N.

1825 - - - - -

1826 - - - - -

RETURN FROM FT. FRANKLIN TO
GREAT SLAVE LAKE IN 1827

Mouth of
Coppermine R.



saved by Indian hunters near the source of Yellowknife River. In January 1822 they reached the Moose Deer Island fort at the mouth of the Slave River and remained until spring before returning over the same route to York factory.

Franklin's Second Expedition.

The second expedition by Captain John Franklin was conceived and promoted by himself in spite of the reluctance of the Admiralty to sponsor the kind of suffering and misfortune experienced in the 1819-22 expedition. The prize, however, of a Northwest Passage seemed possible in view of the work of Captain Parry and others approaching through the Arctic Archipelago. Franklin proposed to chart the coastline from Icey Cape, the farthest east from Alaska, to his own survey at Coppermine River. This would leave only a slight extent of mainland coast unmapped. In support of this project Franklin carefully planned the entire operation and sent on ahead sufficient supplies, boats and men.

Plans called for the party to make its headquarters on Great Bear Lake. This was the only location where a plentiful fishery was available to supply a large party, and that was strategically near the areas to be surveyed. Accordingly, Fort Franklin at the outlet of the lake on the site of the old North West Company trading fort was built by P.W. Dease of the Hudson's Bay Company during the spring and summer of 1825. All was in readiness for the arrival of the main party that same autumn. Specially designed boats arrived in the north via the Hudson's Bay route, while Franklin and his party, fresh from generous receptions in New York, Albany and York, reached Lake Huron and passed on north-

ward over the old North West Company route. The two sections of the expedition met at Methy Portage, the height of land, and descended into the Mackenzie drainage basin together.

Captain Franklin really entered the Mackenzie River for the first time on August 2nd, 1825 (Franklin, 1828, p.12). His plans were to move northward to the base camp on Great Bear Lake and there prepare for the activities of the next open season. The journey downstream to Fort Norman was accomplished quickly in only five days leaving plenty of open season remaining. Franklin had planned to continue down to the sea and at Fort Norman final arrangements were completed. Lt. Kendall was to accompany Franklin to the river mouth and Lt. Back planned to go on as far as Bear Lake River where he would leave the expedition to complete his assignment at Fort Franklin. The weather being fine and a helpful breeze blowing, Franklin took advantage of it to run all through the night stopping only for meals. Just before his boat passed down through the Ramparts, some Hare Indians came out to offer presents of deer meat, and receive powder and tobacco in return. More Indians brought fish where they camped below the Ramparts. With a favourable wind Franklin and crew reached Fort Good Hope by 11:00 p.m. on August 10th, much sooner than Mr. Charles Dease, in charge of the post, expected anyone from up the river. This was two months before the Company boats would arrive with the winter outfit. (*ibid.*, p.23). Departing Good Hope, the party continued downstream interrupted only by frequent stops at Indian lodges. The Eskimo interpreter, brought specially from Churchill, was the centre of attraction among the Loucheux

indians who inhabited the lower Mackenzie Valley as far north as "The Red River" (Arctic Red River).

A few miles downstream Franklin reached Point Separation and like Mackenzie before him, he had to choose which of the main channels to follow. The current seemed to run strong in the most easterly channel and this is the one the group entered (ibid., p.29). As it happened, it was the middle channel of the river and further downstream they observed another distributary leading to the east (ibid., p.30). This too was Mackenzie's course. Franklin used the principle of always choosing the largest and most vigorous stream when presented with an alternative. Accordingly, he followed the main channel through most of the delta keeping the Reindeer Hills on the east in sight, and catching occasional glimpses of the Richardson Mountains in the west. (Map 26). By August 14th he had nearly completed threading a route through the delta, and instead of following a slender northward distributary like Mackenzie, Franklin continued on a more devious course to the mouth of the river. Fog, wind, and very shallow water confused the progress of the party at the mouth of the main channel. Franklin did not realize they had reached the sea, until the clouds lifted and a wide open expanse of water was plainly in view to the northward. Also visible was the northern end of the mountain chain on the west side of the river. On August 15th he directed the boat to the eastern side of the river mouth to secure meat for provisions. They came upon and climbed a conical hummock or pingo from which they could see some of the surrounding country and spied islands

towards the north (ibid., pp.33 ff). The following day in the face of a storm, Franklin's crew managed to make landfall on one of the islands which he located accurately and named Garry Island. From the cliffs of this island Franklin observed and named Pelly and Kendall Islands. These discoveries were attended with the appropriate flag planting ceremonies and toasts to His Majesty's health. What was important to the explorer, however, was that he could observe open sea both to the westward and eastward, and this was welcome intelligence for his coming seasons of exploration along the coast (ibid., p.40).

Strong winds thwarted Franklin's intention to sail to the westward and gain that shore. After he had embarked on the morning of August 18th, he decided to make for the river again and return to the winter base. Along the way they dropped gifts at various winter habitations of the Eskimos so that a favourable impression should greet them when they returned to the sea again. Winds from the northwest enabled the boat to proceed under sail much of the way upstream. They had at last to resort to the tow line above Point Separation, where slow progress was further delayed by rejoicing natives. The whole of the return journey was undertaken in steadily worsening weather conditions. Temperatures were in the 30's and 40's and on August 22nd, they experienced snow and sleet. Fortunately the accompanying wind was from the northwest and the boat was able to proceed under sail. As they approached Fort Good Hope, however, progress was possible only under tow. The men tracked

their boat through the Ramparts on August 28th. All along were signs of the changing season; the leaves on the trees had begun to turn and each day flocks of geese and ducks passed overhead towards the south. On September 1st Franklin reached Bear Lake River and with some difficulty arrived at Fort Franklin at seven in the evening on September 5th (ibid., p.49). His arrival brought about the reunion of the entire expedition personnel.

While Franklin was exploring the mouth of the Mackenzie River, Dr. John Richardson was in Great Bear Lake beginning a precise survey of the shoreline. His intention was to proceed along the north shore to that part of the lake which was nearest to Coppermine River, and to find the location best suited as a depot towards which a party from Coppermine River should head the following year (ibid., p.17) The place decided upon was on Dease River, entering Dease Arm on the northeast arm of the Lake (ibid., p.49). During this journey, Richardson charted around the peninsula upon which the Scented Grass Hills are located and almost to the bottom of Smith Arm. (Map 27). He then passed eastward along the north shore of the lake into Dease Arm. The return journey was to the south shore of this arm and directly back to Fort Franklin. In all, the distance was 483 miles (ibid., p.50). Richardson and Kendall completed the mapping of Great Bear Lake in the spring of 1826. They left Fort Franklin on April 10th, (ibid., p.77) and returned on the first day of May (ibid., p.78) during which time they followed a route eastward along the south shore to McVicar Arm. This

was the site where some of the expedition personnel were engaged in fishing. The survey continued to outline the McVicar Arm, McTavish Arm almost completing the first chart of the coastline of the lake (ibid., p.79).

The winter activity at Fort Franklin during the season 1825-26 was mainly concerned with keeping the large expedition in a state of physical and mental well-being. Plans and communications passed back and forth between the Fort and the other posts, Norman, Good Hope and Simpson. Among the messages communicated by the Hudson's Bay Company's "Express" was a rumour from the Indians that white men were on the north coast east of Coppermine River. At the time they took this to be Captain Parry but it later proved to be a false report (ibid., p.88). Publications and letters from home helped to lift their spirits during the long polar night. Throughout the month of May Franklin and his men watched the events which marked the approach of spring, and at the same time completed the plans and chores for the coming season of exploration. The old boats were repaired and a new one built so that four were in readiness. With two of these boats, Captain Franklin, Lt. Back, Augustus the Eskimo interpreter, and thirteen men intended to follow the coastline of the continent towards the west. It was possible they might meet H.M.S. Blossom which was to sail eastward from Alaska for this purpose, and that the whole party might go out to Canton and thence to England (ibid., p.83). It was also quite possible this western party would be forced to winter on the coast if it failed to meet Blossom or return to Fort Franklin before freeze-up. The

mapping toward the east from the mouth of Mackenzie River was under the command of Richardson. He, Lt. Kendall, the Eskimo Ooligbuck and nine men made up the party. It was the intention of this group to explore the unsurveyed region between Mackenzie River and Coppermine River, and to return by ascending Coppermine River to a place from which they could pass overland to the depot on Dease River. Plans allowed for a boat and provisions to meet Richardson at this rendezvous (ibid., pp. 82 ff). The entire plan for the season had been well thought out, but in case of emergency, Mr. Dease was under instructions to keep Fort Franklin provisioned until 1828. Early in June the ice broke away from the shore under pressure of the wind and allowed Richardson to slip away to Bear Lake River to collect botanical specimens which were in flower at that season. The entire party left Fort Franklin June 22nd, (ibid., p.86).

Difficulty with the ice in Bear Lake River, slowed the progress of Franklin and his men towards the Mackenzie River. Once there, they were forced to track upstream against the spring floods to reach Fort Norman and their remaining supplies. The torment of the clouds of mosquitoes appear to have caused greater distress than the difficult and fatiguing task of tracking the boats (ibid., p.87). They reached the fort on the 25th of June. The two following days were busy with final preparations for the sea voyage. Boats were properly fitted with gear and supplies, and gifts for the Eskimos were stowed away. The men made pemmican and repaired the sails, while the officers completed correspondence and arrangements with Mr. Dease (ibid., p.88).

On June 28th the explorers began to descend the Mackenzie River. Favoured by a strong current and light breeze, the boats made swift progress downstream, but thunderstorms, mosquitoes and variable temperatures plagued them on the way to Fort Good Hope. At the fort, Franklin hoped to learn something from the Loucheux Indians about the habits of the Eskimos, and perhaps get advice concerning the best routes through the Mackenzie delta. The natives appeared to know very little about these topics, and the expedition departed Good Hope on July 2nd with only slightly more intelligence than when they arrived. At Point Separation, which was reached the following day, final division of the expedition equipment and supplies was settled, and Dr. Richardson received his latest orders from the commander. That evening was "spent in the most cordial and cheerful manner", in anticipation of the separation of the two parties on the morning of July 4th, 1826. (ibid., p.94).

During the preceding evening an old Loucheux Indian was able to inform Captain Franklin that the western branch of the river flowed through the delta only a short distance from the mountains and that it would bring him to the sea. (ibid., p.95). Franklin followed the Channel and, with some slight confusion near the outlet, the western party reached open water in the early afternoon on July 7th. Here Franklin and his men had their first encounter with Eskimos, which but for patience and discipline might have developed into a bloody dispute and ended in the complete dispatch of this exploring party. (ibid., pp.99 ff). The natives, several hundred strong, surrounded the

two boats as they became stuck in the mud while the tide receded. With drawn knives and gusto they proceeded to remove from the boats anything which appeared useful or amusing. Franklin and Back had their men well under control, and although this struggle against Eskimos and falling tide continued for several hours, no provocative incidents occurred. In the end, the thievery was not serious and with the courageous help of Augustus, the interpreter, some of the stolen articles were returned. The place of this unnerving incident was called Pillage Point. (ibid., p.107). This incident taught the officers to approach other groups of natives with considerable caution.

Now that the party was out of the delta country and on the exposed sea coast, progress toward the west could only be made at the whim of ice conditions. Northerly winds, pressed the pack-ice to the shore and movement was not possible. Southerly, or south westerly breezes were welcomed as they opened a passage along the coast. In a week's time, Franklin had progressed to Sabine Point (ibid., p.123). On the 15th they encamped behind Key Point. Two days later they were held up by ice at the Firth River opposite Herschel Island. Here they found Eskimos who traded iron with other Eskimos far to the west and with Indians trading from the Yukon system via the Firth River. Upon examination of this ironwork, Franklin concluded it was Russian and learned also it had been traded to people east of Mackenzie River (ibid., p.130). Progress to the west became more and more difficult. Fog occurred so frequently that proper astronomical

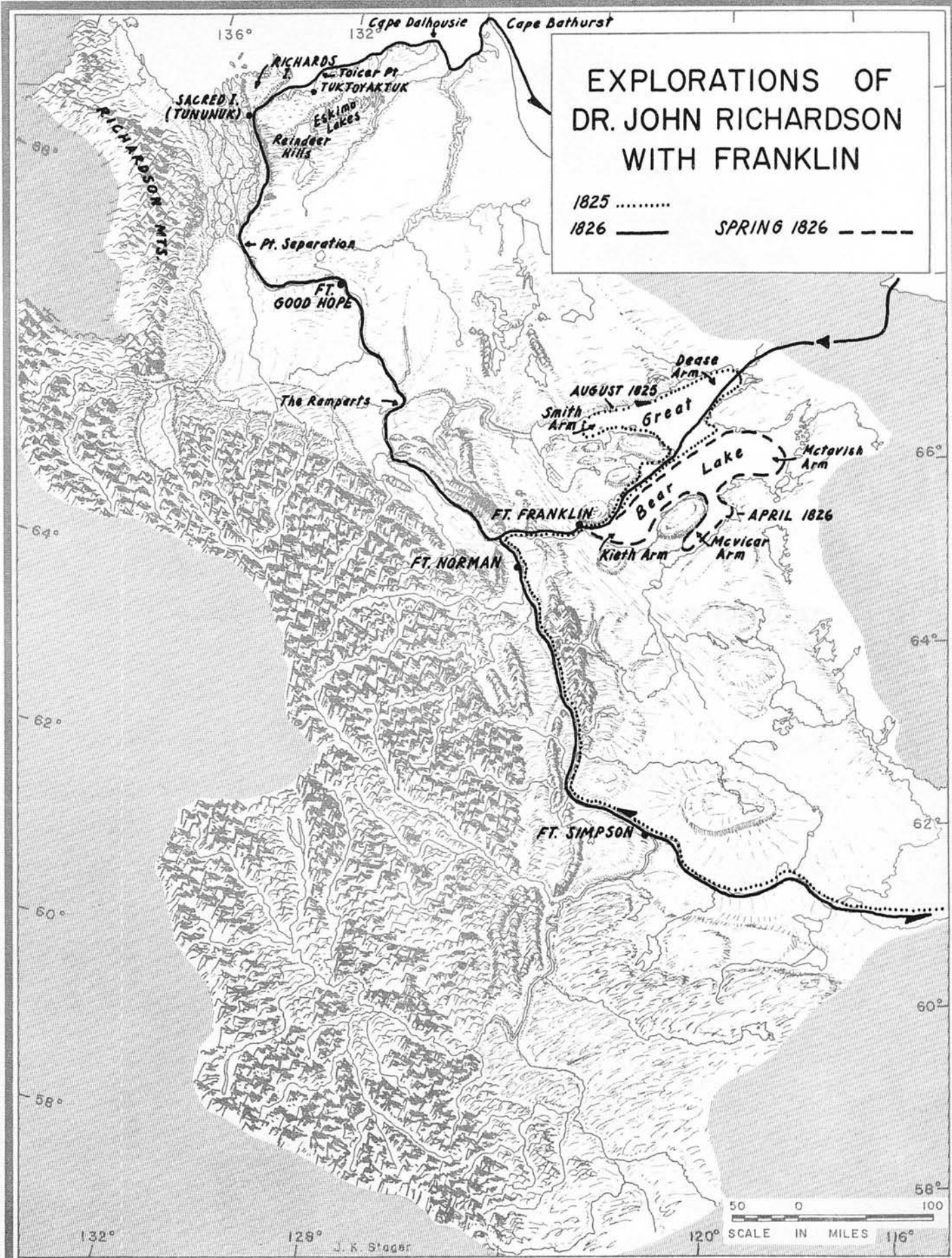
observations were difficult. Also, as the company pushed slowly westward the shore approaches became shallow and forced the boat to travel further out from land. Sometimes reefs or offshore bars protected the beach from grounded ice masses, but the lagoons enclosed by these reefs were invariably too shallow for Franklin's boats. They were forced to launch their boats beyond the reefs, where grinding ice cakes permitted few opportunities to travel. There were occasional contacts with Eskimos, one of which was at Barter Island. This was the general locality where trade took place between the Herschel Island Eskimos and those to the west. Eskimos familiar with the Mackenzie River mouth did not go beyond this point (ibid., p.149).

On the 16th August, Franklin's party reached their farthest west at Return Reef, just west of Yarrow Inlet. Without their knowing, only 160 miles separated them from the advance party of the H.M.S. Blossom. Franklin had, however, made a rational decision to return to Fort Franklin, basing his judgment upon the signs of the change of season and upon his experience in two previous years. Just before departure on August 18th, he was able to observe the coast to Beechey Point (ibid., p.166). Progress on the return journey was intermittent at first, but later strong winds and open water permitted rapid travel towards the river mouth. They stopped overnight at Herschel Island but made straight course to Kay Point and on to the delta. Narrowly did the party miss being annihilated by Mountain Indians (Kutchin) who were fearful that their trade with the Eskimos would be upset by Franklin's gifts. On the

EXPLORATIONS OF DR. JOHN RICHARDSON WITH FRANKLIN

1825

1826 ——— SPRING 1826 - - - -



1st day of September, they were well into the delta and with a slight delay caused by proceeding too far up Peel Channel into that river, the group worked back to the Mackenzie and upstream to Fort Good Hope where they arrived in the afternoon of September 7th. On the return to Fort Franklin two weeks later they found that the eastern party had reached that place on September 14th (ibid., p.184).

Richardson's Explorations.

The eastern survey party under Dr. Richardson entered the East Channel of Mackenzie River on July 4th where they took leave of Captain Franklin. This river took them over to the base of the Reindeer Hills, (Caribou Hills) that flank the east side of the delta. They passed one night at or near the present Reindeer Station which was the place from which the natives crossed over to the Eskimo Lakes. At the Southern end of Richards Island (ibid., p.192), Sacred Island (Tununuk) was observed and so named because it proved to be the Eskimo burying ground. It is from this place that the east branch of Mackenzie River departs from the delta and cuts a valley between Richards Island and the mainland. Along this route Richardson met Eskimos for the first time and had a similar experience to that of Franklin, although not nearly as harrowing because the numbers of natives was not so great (ibid., pp.193, ff). Eventually the two boats were able to lose the pursuing kayaks by pulling toward the open sea, but they were soon beaten back by a gale. The boats found shelter in an inlet, called by Richardson, Refuge Cove (Tuktoyaktuk). Further progress east

around Toker Point became difficult as they met, for the first time, ice jammed against the shore. With some delay the ice moved off shore and Richardson continued eastward. He thought this entire portion of the coast was composed of islands with intervening inlets that connected with the Eskimo Lakes believed to lie to the south. East of McKinley Bay the water was shallow for a long distance out from the shore. They found ice floes grounded about 10 miles from the land and it was almost impossible to land the boats on the shore (ibid., p.219). Once around Cape Dalhousie, however, the land margin trended southeasterly and Richardson directed the boats to the high summit of Nicholson Island on the south side of Liverpool Bay.

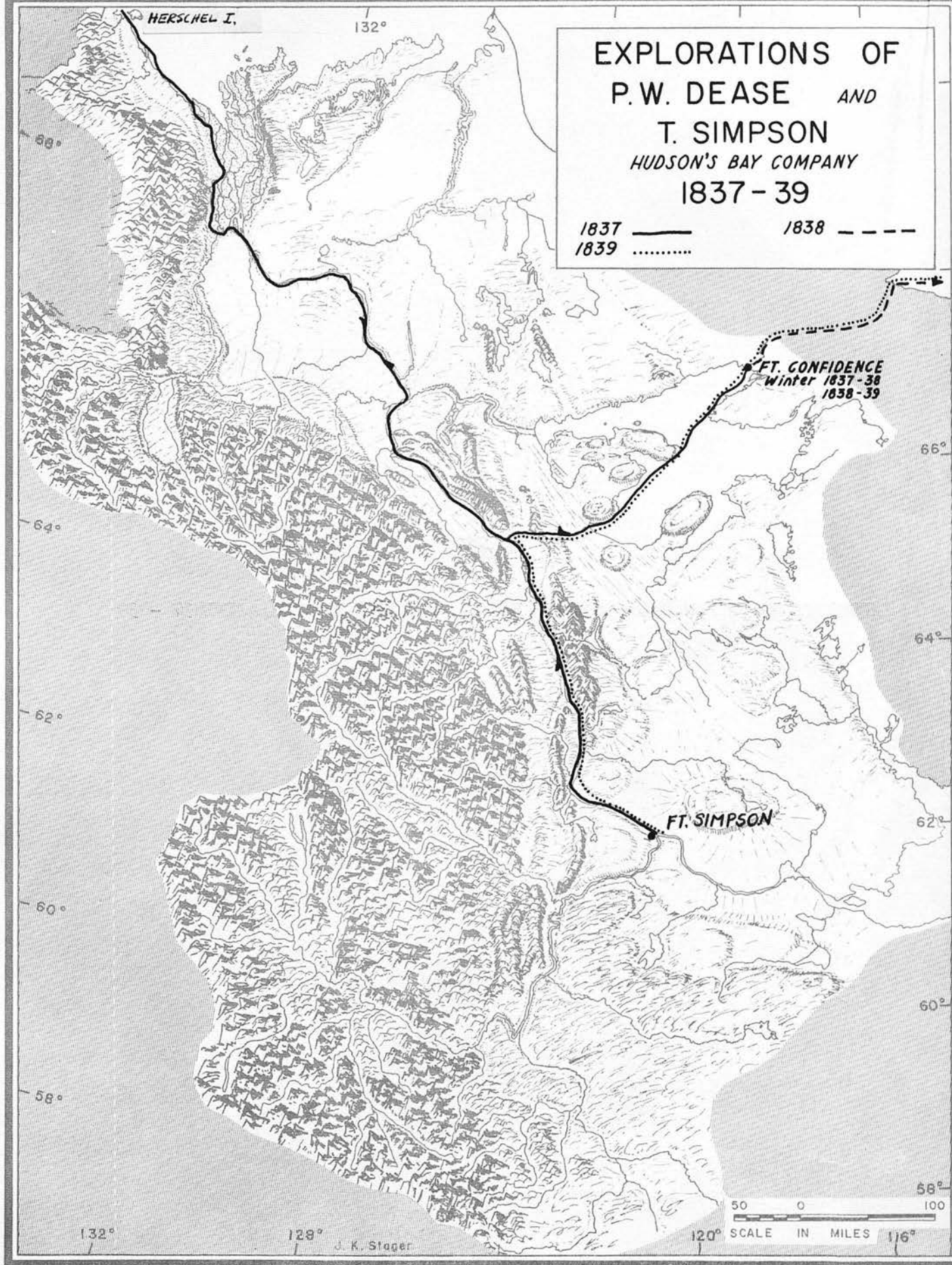
Viewing the surrounding country from the top of Nicholson Island, Richardson could see to the southward a winding channel of the Anderson River, but he did not seem to recognize it as a major stream (ibid., p.222). A much more inviting re-entrant, Harrowby Bay, caused the party to pause and consider whether it should be explored. Richardson, however, observed the tidal action in the bay and noted the lack of freshness to the water before he concluded that no passage existed in that direction (ibid., p.224). Eskimos on the north side of the bay informed the party that not much further along they could reach the open sea, between two islands and the mainland. With some hard work the boats were driven across the bar between the island and the cape, and immediately the sea was noticeably very salty and greenish in colour. (ibid., p.227). Richardson named this

latter point Cape Bathurst and he believed at that time that except for "Icy Cape" in Alaska this point was the most northerly extent of the American continent (loc. cit.). Once around the cape, they found it was easy to approach the shore with the boats, and made camp for the night of July 18th a short way to the south. In five days the two boats skirted the bottom of Franklin Bay and north again around Cape Parry. Once they could see the east side of Darnley Bay, they crossed directly over to Cape Lyon. The journey east from this point was easy and without incident. No Eskimos were encountered after leaving Maitland Point, although signs of them appeared occasionally near Cape Parry. They became more numerous, however, southward along the coast toward Coppermine River. On the 7th of August, Richardson saw Cape Hearne which he thought he recognized. That evening, as they camped, his suspicions were confirmed and Richardson knew they had succeeded in closing the gap of unknown coastline between the mouths of the Mackenzie and Coppermine rivers, (ibid., p.259). The next night the expedition camped on Coppermine River not 100 yards from an encampment of the 1821 expedition (ibid., p.261).

The return to Great Bear Lake via Coppermine River was on foot above Bloody Falls. The party headed on a predetermined compass course directly toward Dease River, much to the amasement of some Indians who had joined up with Richardson's group. They reached the mouth of Dease River, on Great Bear Lake, on August 18th and due to delay caused by an imperfect rendezvous, the eastern party did not arrive at Fort Franklin until September

1st. Dr. Richardson left by boat almost immediately to complete geological observations at Great Slave Lake and therefore was not present when Franklin returned.

When the western party was reunited with the eastern group at Fort Franklin later in the month of September, it was soon evident that the supplies at the fort were too slender for an entire winter's provisions. Captain Franklin, after Christmas, proposed to take part of the group out to Fort Chipewyan over the ice. The ice of Mackenzie River was very rough, and an overland route seemed better. Accordingly on February 20th, 1827, Franklin and five men, guided by two Indians, began the sledge journey southward (ibid., p.278). The route they followed was east of the Franklin Mountains where they travelled more easily over the glaciated plain and on the surfaces of the large lakes like Blackwater Lake. The guides led the group to the Mackenzie River 30 miles above Fort Simpson, where they arrived on March 8th, (ibid., p.300). The overland journey followed the winter trail from Fort Franklin that had been used ever since the first Fort was built on Great Bear Lake in 1799. A week later Franklin continued his journey to Fort Resolution, then on to Fort Chipewyan. This meant that the expedition was in three different locations; Dr. Richardson was on the Saskatchewan River collecting plants; Captain Back and the main body of men still remained at Fort Franklin, Franklin and Richardson meeting on the journey to Montreal travelled together via New York to England. Captain Back and the others followed later, the whole being returned to England by October 10th, 1827 (ibid., p.315).



EXPLORATIONS OF
P.W. DEASE AND
T. SIMPSON
HUDSON'S BAY COMPANY
1837-39

1837 —————
1838 - - - - -
1839 ·······

FT. CONFIDENCE
Winter 1837-38
1838-39

FT. SIMPSON

50 0 100
SCALE IN MILES

Explorations of P.W. Dease and T. Simpson, Hudson's Bay
Company, 1837-39

The two expeditions by Franklin through the interior part of North America and the work of Parry, Ross and Back, altogether represented splendid progress in making known the unexplored northern coast of the continent. The Hudson's Bay Company had half-heartedly helped the first Franklin journey to Coppermine River and it nearly ended in disaster. They were more generous when Franklin returned in 1825, and Mr. Peter Warren Dease was attached to that expedition. The same Mr. Dease, with his experience in the logistics of extended travel through new lands, was a suitable leader for an exploration venture sponsored by the Company. A directive from Governor George Simpson was addressed to Mr. Dease and to his young assistant Thomas Simpson and dated at Norway House, 2nd July 1836. (Simpson, 1843, p.2). In it was suggested a plan for the completion of the mapping along the north coast of the continent. Two gaps remained. The coast had to be surveyed between Franklin's ~~farth~~ west, at Return Reef on the north Alaska coast, and Point Barrow. The other gap of unknown coastline was between Bathurst Inlet and the mouth of Back's Great Fish River in Chantrey Inlet. For these two tasks of exploration the Hudson's Bay Company undertook the expense and would receive credit if the venture was successful. Dease and Simpson were to be their instruments of success.

In preparation for mapping, Simpson spent the early winter of 1836 in Red River Colony, increasing his competency in

astronomical surveying. In the meantime, at Fort Chipewyan Dease was supervising the building of two boats to be used on the journey and making other preparations. Simpson left Red River on 1st December 1836 and in two months walked to Fort Chipewyan, arriving as he had planned, on February 1st, 1837. (ibid., pp. 26, 65). In April they were able to test the new boats, and by June 1st with all the arrangements complete, Dease and Simpson departed the fort.

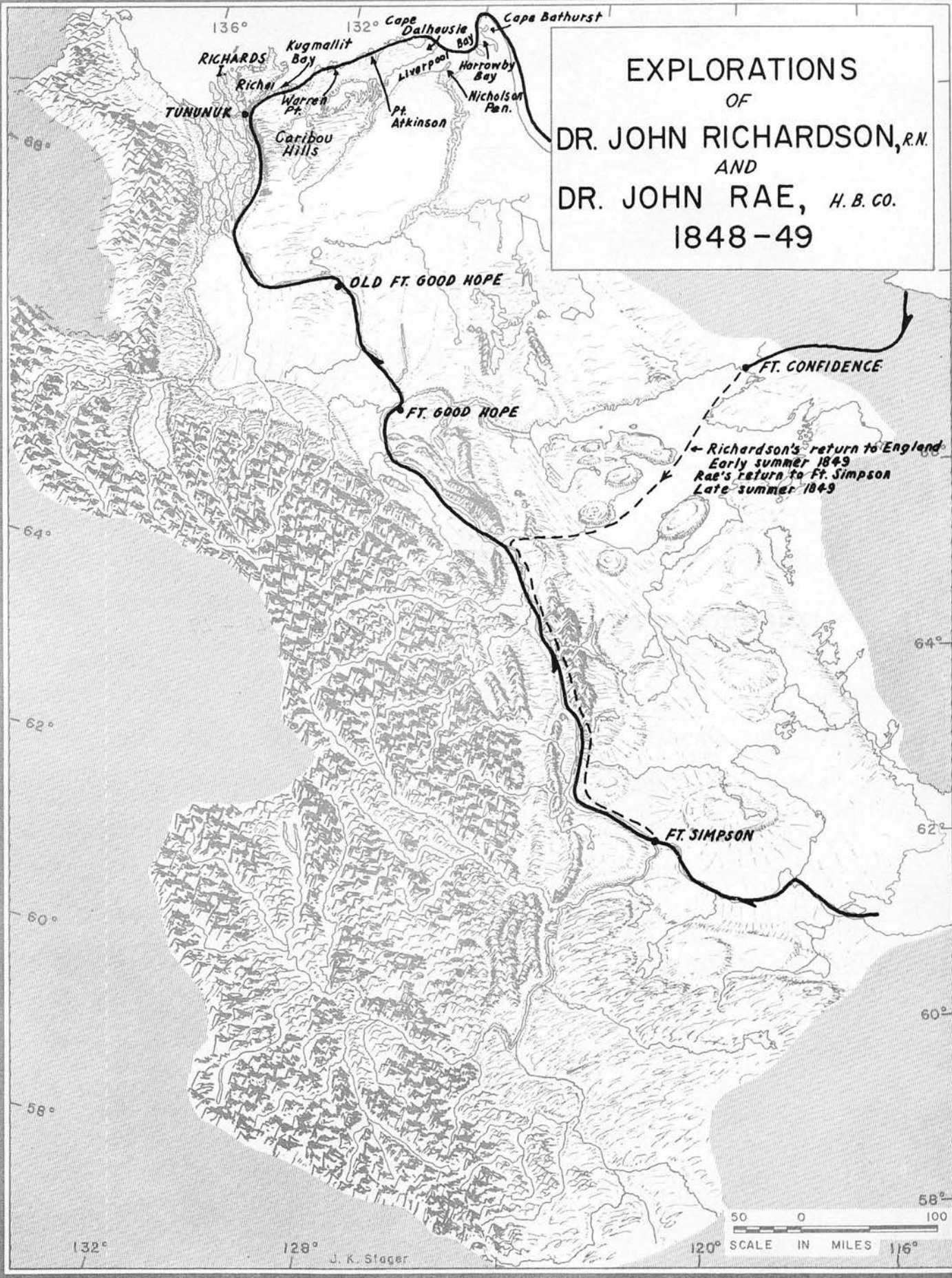
The ice on Great Slave Lake caused their first delay. These great lakes were always barriers to early travel in the district. The ice seldom disappeared completely before July and although it did break up around the shores, variable winds shifted the floating mass in an unpredictable fashion. By June 26th they were on the Mackenzie River and noticed that the vegetation was more advanced away from the cooling influence of lake ice. On the journey down the Mackenzie River, Dease and Simpson were on the move most of the time, to hasten the transit to the coast. They were met amicably by the downstream succession of Slave, Hare and Loucheux Indians. Upon entering the delta of Mackenzie River, the two boats entered the West Channel and passed the mouth of Peel River. Instead of following the Peel Channel as Franklin did in 1826, they found themselves in that particularly sinuous channel later called Husky Channel. It proved to be a better one, for it skirted close to the mountains, and was deep water all the way to the sea at Shoalwater Bay (ibid., pp. 107-8). The expedition saw the open sea on July 9th, 1837. Not far west of the delta the rather balmy

weather and open water changed to colder temperature, fog and sea ice. It became tedious inching along the coast, in a manner not unlike that experienced by Franklin before them. Simpson and Dease, however, reached Return Reef by the 24th of July, more than three weeks earlier than the 1826 expedition. But then ice and fog seemed to turn against them, and at the end of the month, they had managed to proceed only 4 miles in as many days (ibid., p.141). Only two degrees of longitude, or about 50 miles still separated the group from Pt. Barrow, and this was all that remained to be surveyed. Simpson proposed that he make this journey on foot as the season was getting late and from their experience thus far, travel by boat seemed hopeless. On 1st August, he set out with a few men. They soon encountered some Eskimos whom they persuaded to lend Simpson an umiak. The large skin boat, used by women and children to transport the household goods, was strong, light-weight, and eminently suited to travel over ice and through shallow water. In two more days the party reached Pt. Barrow - seeing it for the first time "a little before 1 in the morning of the 4th" (ibid., p.153). There were quite a number of Eskimos encamped at Pt. Barrow and they displayed evidence of their trade contact with the Russians further west. After bartering and being entertained by dances, the small party began the return journey. When they reached the people from whom they had borrowed the umiak they purchased it outright by giving the owner an axe and withdrew to rejoin Dease and their waiting companions. In contrast to the westward progress the return to the Mackenzie

River was swift. Strong westerly winds drove the boats under sail, not without some danger, over a sea generally free of ice barriers. Two days were lost because of contrary winds and ice jams, but they reached Shoalwater Bay and entered the West Channel of the river on the evening of August 17th (ibid., p.184). Dease and Simpson continued upstream to Fort Norman. At the fort they took delivery of supplies that were intended to support subsequent exploration activity along the coast to the east. On September 14th, with freeze-up near, Dease and Simpson reached Fort Franklin in transit to the proposed wintering site at Fort Confidence on Dease River. Wind and heavy seas delayed their passage to the opposite end of the lake, and in spite of much snow and new ice forming on the water they reached Fort Confidence safely on September 25th, 1837. (ibid., p.199).

During the summers of 1838 and 1839, the same two explorers succeeded in mapping hundreds of miles of coastline eastward from Bathurst Inlet to Chantrey Inlet. They were first to record the outline of the south shore of Victoria Island. For these successful expeditions, they used Fort Confidence as a base, and through the winters of 1837-38 and 1838-39, Simpson travelled extensively around the east end of Great Bear Lake. His journal has much valuable information concerning this country and the people native to it.

EXPLORATIONS
OF
DR. JOHN RICHARDSON, R.N.
AND
DR. JOHN RAE, H.B.CO.
1848-49



Dr. John Richardson, R.N., and Dr. John Rae,
Hudson's Bay Company in search of Franklin

1848-49

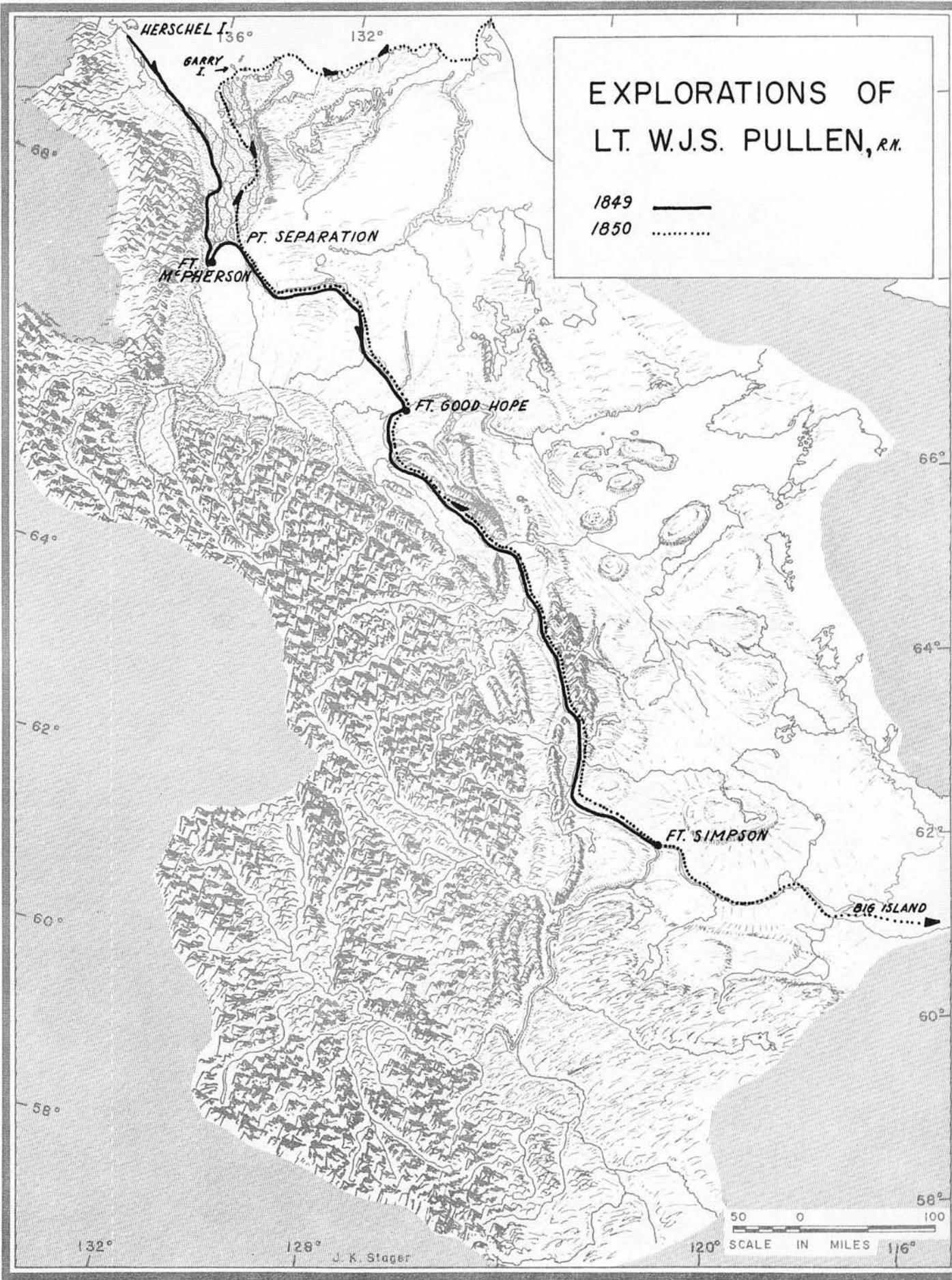
Dr. John Richardson was no stranger when he came to Mackenzie River in July 1848 in company with Dr. John Rae of the Hudson's Bay Company. Their object was to search the coast for signs of the missing Franklin expedition. In fact, it was on two previous occasions in company with the same John Franklin they now sought, that Richardson reached the north country. A space of 21 years had elapsed since he had first view of the "Grand River", and at the posts along its course there were many changes to be seen. Elsewhere the banks of the river had not altered greatly, with one exception perhaps, evidence of forest fire. The party reached Fort Simpson on July 22nd and along the route Richardson noted that the distances as recorded by Franklin in the 1825 expedition were greater than he calculated this time. (Richardson 1852, p.102). On the one day stopover at Simpson, Richardson made further arrangements with Mr. Bell for transport of additional supplies to the wintering station on Great Bear Lake. Then continuing down north, in order to save time, the boats were allowed to drift with the current at night and active rowing or sailing continued in daylight. The group arrived at Fort Norman just in time for breakfast on the 26th of July and obtained, of all things, a bottle of milk for that meal! (*ibid.*, p.116). Later that day Richardson and Rae passed Great Bear River to a place a few

miles beyond. They decided to remain on shore for the night rather than drift because no one knew the river beyond this point, and Richardson would not trust his memory after so many years absence (ibid., p.127). During the daylight the boats again passed along the south side of the Norman Range and through the mountains at the Sans Sault Rapids. That night it seemed safe to continue the downstream drift and in the morning they passed through the Ramparts. The expedition stopped at Fort Good Hope briefly then proceeded down river, rowing in the day-time and drifting with the current at night. On the night of July 29th the searching party was at old Fort Good Hope. The next day took them by Arctic Red River and at Point Separation Richardson stopped to bury a cache of pemmican and a note for any members of H.M.S. "Plover" which was participating in the Franklin search by sea from Behring Strait. Considerable care was taken to prevent natives or others from disturbing this cache. A tree, with branches lopped off and blazed, marked the site, but the actual burying place was 10 feet away from the tree. Excess dirt was removed, and the ground carefully tamped, then a fire was made over the spot so that the ashes could identify the location. Only men from the Plover knew of these plans and when they arrived in September 1849 they found the depot safe (ibid., p. 137-8). Since it was intended to search the coast east of the delta, the boats entered the East Channel and made 22 miles before stopping for the night. On August 1st and 2nd they travelled north along the base of the Caribou Hills, then leaving the forested region at latitude 68°55' Richardson and

Rae passed Sacred Island or Tununuk, to enter the river between Richards Island and the Mainland. With some stops for astronomical observations the searchers proceeded to Point Encounter where some 22 years before Eskimos had tried to plunder the boats of the eastern detachment from the Franklin Expedition. The next day the three boats reached the open water of Kugmallit Bay and the men of the Eskimo village nearby about 200 strong, came out to barter. There was less difficulty in restraining the natives this time than in 1826, probably because a strong wind was blowing the expedition boats out to sea and away from the mainland. Gradually the kayaks fell behind or returned to shore and the searching expedition made for land further north and east. They landed east of Warren Point briefly and later worked eastward against another strong wind to the far side of Hutchison Bay. The water level had been raised by the onshore winds and slight tide, so that with the abatement of the storm the subsiding water left the boats high and dry. The delay was somewhat compensated for by successful hunting on the part of Dr. Rae. The next day, in an attempt to avoid heavy seas on the open water, the boats were taken in the lee of some sand shoals. This move eventually led to great difficulty in finding a course through the confusion of sand islands and shallow pools peculiar to this portion of the coast. Eventually, however, they reached Point Atkinson late in the afternoon of August 5th (ibid., p.154). Stormy weather kept

EXPLORATIONS OF LT. W.J.S. PULLEN, R.N.

1849 ———
1850



summer of 1849. With only one boat serviceable, a small party was all that could carry on the search. Accordingly, Rae was instructed to do this, while Richardson withdrew the English party to the Mackenzie posts and he returned to England via Canada and Boston. The men were taken back to England from York Factory.

During the summer of 1849, Dr. Rae searched the coast of North America eastward from Coppermine River. He returned to Fort Simpson in September and assumed charge of the trading in the Mackenzie department.

Lt. W.J.S. Pullen, R.N., of H.M. Brig "PLOVER"

Lt. Pullen's part in the Franklin searches began in 1849 when he was part of a group organized to search the coast from Behring Straits to the mouth of the Mackenzie River. Pullen was a complete novice in the arctic environment and had to rely upon what advice he could get from the local natives plus judgments based on his own good sense. He had difficult territory to search where Franklin before him was not able to make impressive progress, and later a more resolute Thomas Simpson managed to complete the survey by leaving the sea in favour of walking. Now Pullen was asked to go along this coast from Wainwright Inlet and to the delta and return in the same season! If this was not possible, and it was not, he was instructed to proceed up the Mackenzie River to winter at one of the Hudson's Bay Company stations (Pullen, 1947, I, pp. 40-43). He transferred

from the "Plover" to a small private boat, the "Herald" at Wainwright Inlet on July 25th and sailed easily to Point Barrow and found the passage which was reached on August 2nd. The Eskimos gave a dismal prospect of ice conditions on ahead, so that Pullen planned to continue in two of the 27 foot whalers so familiar to the navy. He also secured an Eskimo umiak for support and with 73 men in all began to push eastward. The first few contacts with the Eskimos proved strained, possibly because they had nothing with which to barter and probably because Pullen was both inexperienced and in a hurry. These contacts led him to forego any other visitations and with only light ice to pass through, they made quick progress. He refused native invitations to land at Herschel Island, and in open water easily came to the mouth of the Mackenzie on September 2nd. Four days later they reached Fort McPherson having passed up the Peel or Husky Channels in the delta. Pullen seemed somewhat surprised that they could not remain at McPherson with Mr. Hardisty, who recommended they should push on to Fort Simpson. Six men were left behind to winter, and the remainder went up the river, stopping to discover the cache secreted by Richardson the year before, and instructing the party to proceed to Simpson. At Fort Good Hope Lt. Pullen exchanged one of his cumbersome boats for a Company boat and went on to reach Fort Norman September 23rd. Dr. Rae greeted the party at Fort Simpson on October 3rd and sent a large part of Pullen's group to Big Island to be sustained by the fishing at that place.

Lt. Pullen found the long winter at Fort Simpson a boring

experience and he prepared to take his men out of the country via the fur-trade routes to Hudson Bay. (Pullen, 1947, II, p.23). After the spring break-up as his group were entering Great Slave Lake, they met the spring express heading north with a letter from the Admiralty commissioning Pullen to continue the search along the arctic coast east of Mackenzie River. With two boats, one brought up the river from the coast in 1849, and one provided by the Company, Lt. Pullen and 13 other men left Fort Simpson on July 11th 1850. In a week they were at Point Separation. The expedition probably sailed along the middle branch in Mackenzie delta because Pullen landed on Garry Island on July 20th (loc. cit.). Off the mouth of the river the sea was quite clear of ice and Pullen made a swift, uninterrupted passage across to Harrowby Bay by August 8th. At Cape Bathurst he was blocked by ice, and the searching party remained camped along with the many Eskimos. On August 15th Pullen gave up hope of progressing eastwards, and retreated to the Mackenzie arriving at the river by the end of the month. Once again Pullen and his men were guests of the Hudson's Bay Company wintering at Fort Simpson and the fishery at Big Island. The next summer Lt. Pullen and his men succeeded in quitting the country via Hudson Bay and he arrived in England in time to take part in the Franklin searches under Sir Edward Belcher (ibid., p.25).

IV. THE ABORIGINES AND THE

FUR TRADE

THE ABORIGINES AND THE FUR TRADER - A NEW WAY OF LIFE

Conditions and Aspects of the Trade

The appearance of Alexander Mackenzie at the Grand River was undoubtedly a surprise to the Indians who happened to have been camped on the riverside at that time, but the advent of the white man in the country was scarcely unheralded. Already the relative tranquillity and stability of the native domain had been disrupted by wars and the ramifications of wars that came from the east and south. Marauding Crees with white man's weapons and a taste for white man's gifts ranged widely in a quest for the furs which brought to them these desirable goods. Acting as middlemen between the whites to the east and Indians to the west they secured considerable power and exerted great influence. Raiding parties had gone all the way down the Mackenzie before the explorer arrived, and the Athapaskan natives retreated in confusion before the Cree Indians. Those nations first encountered by the Cree, the Beaver and Slave Indians, in turn oppressed more remote tribes and the wave of shock reverberated to the ends of the land.

Disease.

About this time a second warning of impending change occurred when the diseases of the European entered a seemingly septic environment. This subject will be dealt with more fully when considering the impact of white settlement itself. But before the trading posts were established smallpox had spread through the north between 1780-83. Probably the Mackenzie basin was

not exempt, and among natives quite unprepared physically for such a disease, it took fearful tolls. David Thompson's journal discussed a scene in 1781: "None of us had the least idea of the desolation this dreadful disease had done, until we came up to the bank to the camp and looked in the tents, in many of which they were all dead, and the stench was horrid; those that remained had pitched their tents about 200 yards from them and were too weak to move away entirely, which they soon intended to do; they were in such a state of despair and despondence that they could hardly converse with us, a few of them had gained strength to hunt which kept them alive. From what we could learn three-fifths had died of the disease." (Thompson, 1916, p.321). Samuel Hearne estimated that the Northern Indians (Chipewyans) lost nine-tenths of their numbers in the scourge (Hearne, 1795, p.200). The 1780-83 epidemic of smallpox is best documented and probably was most severe in the plains along the Saskatchewan River, and with such a fearful loss of life the spirit of the Plains Indians disintegrated, thereby enabling the traders to consolidate control over these natives. However, though it was disease that weakened the Indians, it was alcohol that nearly destroyed them.

Alcohol.

The picture was quite different in the Mackenzie region. It is not possible to say what quantity of spirits entered the district soon after it was opened for trade, but the general pattern of trade in rum during this time of expansion and competition was one of greatly increasing consumption. The

North West Company in all their trade saw the consumption change as follows: 1799 - 10,189 gallons; 1800 - 10,098 gallons; 1801 - 10,539 gallons, 1802 - 14,850 gallons, 1803 - 16,299 gallons and 1804 - 14,400 gallons. Added to this was the amount of rum poured into the country by the XY Company, which averaged 5,000 gallons from 1802-1804, so that during this period over 19,000 gallons of spirits were traded from Montreal to the Mackenzie basin. (Innis, 1956, p.269). The furious competition slowed considerably in 1804 when the XY Company became part of the North West Company once again. There was still the Hudson's Bay Company which was aggressively expanding their operations into the heart of the territory of the Montrealers, but this did not include the Mackenzie basin. As a consequence, the wanton trade in liquor in the Mackenzie region was short lived, probably from about 1800 until 1804 or shortly thereafter. The Indians of the region were, by comparison to the rest of the country, scarcely affected by the product (H.B.Co., Reports on Districts, Mackenzie's River, 1822-23, p3).
Liquor continued to be brought into the country/^{until}after the union of the North West Company and the Hudson's Bay Company in 1821, but it was more for the use of the traders than the Indians. It was forbidden absolutely from entering the Mackenzie River Department after 1826 (Franklin, 1828, p.11).

Trinkets, Tools, Tobacco and the Introduction of Trade.

More important than the plying of the Indians with liquor was the insidious way that the trade for furs began. The Europeans had many things to offer the aborigines which in turn

fascinated and entertained them, or provided them with tools and equipment that greatly reduced the hardships of their normal life. The standard procedure was first to dispense trinkets and small tools calculated to intrigue, please, and most important, to create a desire for more of the same from a wider selection of goods. Mackenzie on his journey when met by Slave and Dogrib Indians began his relations as follows: "We made them smoke, though it is evident they did not know the use of tobacco; we likewise supplied them with grog; but I am disposed to think that they accepted our civilities rather from fear than inclination. We acquired a more effectual influence over them by the distribution of knives, beads, awls, rings, gartering, fire-steels, flints and hatchets;" (Mackenzie, 1902, pp.231-232). The gifts given were a judicious mixture of the utilitarian and captivating. The advantage of the steel knife, awl, hatchet and fire steel needed the simplest demonstration for an Indian to appreciate, as in his mind's eye he must have compared them with his own less effective and laboriously fashioned tools. Beads, rings and gartering had great appeal for the natives as nothing in their environment was as brightly coloured or so easily adapted to personal decoration (that distinguished men of skill, wealth and position).

A further stage in the generation of trade for furs followed the simple giving of presents. Gifts convinced the Indians that the European had wonderful things which they the Indians could also enjoy. The traders at first exchanged some furs about the Indian camp for valuable items like large knives and

quantities of beads, and indicated to the aborigines what skins were most desirable. "As he mentioned that there were some beavers in this part of the country, I told him to hunt it, and desire the others to do the same, as well as the martens, foxes, beaver-eater or wolverine etc., which they might carry to barter for iron with his own nation, who are supplied with goods by us, near their country." (ibid., pp.292-3). Mackenzie addressed these remarks to a Dogrib Indian living among the Hare people and suggested to him the middleman technique of draining the fur produce from as wide an area as possible tributary to each trading post. These general directives were, without doubt, accompanied by special instruction in the best methods of how to skin animals and prepare them for the trader.

Certain of the Indians preferred certain of the goods. Early on, the Hare Indians were especially fond of iron or tin (Mackenzie, 1902, p.292), and the Loucheux had a passion for beads, in particular a small white bead which the traders soon found difficult to keep in stock. (H.B.Co., Reports on Districts, Mackenzie's River, 1925, p.6). The desire for the small white beads continued in excess of the natives' need for decoration and to the exclusion of more useful items of the trade. Governor Simpson at last ordered the bead trade reduced and proposed that articles of practical value to the Indian life and hunting methods should be substituted. (H.B.Co., Reports on Districts, Mackenzie's River, 1834, p.39).

The Indians of the Mackenzie region submitted quite peacefully to the introduction of a changing way of life. They did

not resist it as the Plains Indian had done, nor, on the other hand, had they taken the opportunity to gain material wealth and comfortable living either by relentless prosecution of the hunt or territorial expansion as had the Cree Indians. The people of the Mackenzie River early displayed a temperament which would lead to a later judgement of them as lacking in virility and being without vigour while responding to the stimulus of another civilization. (Jenness, 1960, p.263).

Trade Tools in Demand.

As the traders reached the Mackenzie region the pattern of initiating trade was well established. After all, as the fur trade advanced across the country the experience of dealing with new aboriginal groups accumulated and this taught the Europeans the needs and weaknesses of the native Indian. Throughout North America was a culture dependent upon bone, stone, wood, bark and animal skins for all its material needs, and the sudden appearance of iron was to the Indian a marvellous gift of the gods. Thus iron was usually the first introduction in the form of knives, hatchets and awls. Two important tools evolved in the experience of the trader and they were the ice chisel and a trenching iron. The one sustained life by facilitating winter fishing, and the latter was a tool which aided the capture of beavers. "Formerly the beavers were very numerous, the many lakes and rivers gave them ample space, and the poor Indian had then only a stick shaped and hardened in the fire, a stone hatchet, spear and arrowheads of the same; thus armed he was weak against the sagacious beaver who on the banks of a lake

made itself a house of a foot thick or more; composed of earth and small flat stones, crossed and bound together with pieces of wood upon which no impression could be made but by fire. But when the arrival of the white people had changed all their weapons from stone to iron and steel ... the beaver became a desirable animal for food and clothing and the fur a valuable article of trade;" (Thompson, 1916, pp.112-113, 119). The trenching iron in the hands of the Cree Indians made them relentless beaver hunters. This was true also for the Iroquois who followed the traders to new lands and hunted thoroughly before abandoning an area that was hunted out. (Innis 1956, p.264). Somehow the trenching iron did not appeal to the Mackenzie River natives, and there were numerous complaints from the traders about the Indians' refusal to use these items. "Nor can all our arguments get the better of this lazy habit" (H.B.Co., Journal, Fort Simpson, Nov. 1, 1825). Apathy to half-hearted interest in fur hunting was exhibited by the natives, so long as they had a few iron tools. Besides, fur game was plentiful and caught easily enough when the natives wished to trade for their simple wants.

The change from hunting caribou and moose to hunting beaver brought also a slight change in diet, and committed the natives to hunt beaver because it was becoming easier to catch. But it was still easy to snare rabbits in the good years, and caribou were not scarce. The Indians did not immediately become dependent upon European goods.

A much desired item of trade was the simple copper or brass kettle. Indian containers of woven root and bark were much inferior to the European kettles which, through experience, the traders discovered were more durable when made of copper than brittle cast iron. Besides copper was lighter and this was an important consideration for goods which had to be moved inland by manpower. Such kettles were an immediate delight to the Indians and they sought more of them. (H.B.Co., Reports on Districts, Mackenzie's River, 1825, p.7). These kettles, of course, could be suspended directly over the fire eliminating the tedious and much less satisfactory method of dropping in hot stones to produce boiling. The native method of food preparation changed from meat or fish mostly roasted on spits or sticks before fires and embers, to meat and fish usually boiled in the new kettles.

Firearms.

The most marvellous instrument possessed by the white man was, to the Indian, undoubtedly the gun. They were frightened by its noise, but they were almost unbelieving when a target animal dropped lifeless to the ground at a distance greater than they could shoot accurately with an arrow. Any people in possession of such a wonderful "talking stick" must certainly be superior beings. The Nahani Chief, when he first visited the white man's post, said "I am like a child now in my own estimation, you treat us so well, and I have nothing to give makes me ashamed to speak ... the whites have told us only truths although we have seen them but twice ... it is the whites who

have made the Earth, we see it now." (H.B.Co., Journal, Fort Simpson, July 5, 1824). Guns were severely restricted upon first contacts with Indians. In spite of caution the firearms were sometimes turned on the whites as happened in the massacre at Fort Nelson in the winter 1812-1813. (Keith, 1890, p.125). Once introduced the natives practically threw away their bows and arrows and depended entirely upon the new weapons. These new weapons had to be constantly resupplied with powder, balls, and flints which could only be obtained from the white man's post. Thus caution in the case of distribution of powder probably led to a shortage of powder with attendant starvation and climaxed in the raid on Fort Nelson (ibid., p.126). Guns were still not widespread in the district in 1822 almost a quarter century after trade began and the natives still used bows and arrows and were not skilled in the use of a gun. (H.B.Co., Reports on Districts, Mackenzie's River, 1822-23, p.5). The best armed Indians were the Slaves around Fort Simpson and at Fort Liard, and these too were the best hunters of the district. The Dogribs of Horn Mountain and the region up to Lac la Martre were more inclined to hunt in the old way and trade for their necessities because they were only reasonably well armed. (ibid., 1825, p.1). Farther from the main forts the use of guns diminished. The Mountain Indians, Nahanis had no firearms at all until after 1823 or 1824, and in 1828 guns had not traded beyond the mountains into the country to the west. (ibid., 1828, p.69).

When guns were first traded to the Indians outside the

Mackenzie district they often set out on rampages of conquest against other tribes. On the other hand, when they were introduced among the individual tribes within the Mackenzie region the consequences were less serious. There were "wars" between groups, but as often as not the result was a skirmish within one tribe as happened among the Nahanis in 1828 (ibid., 1829, p.2). These disruptions were always a disadvantage to the trade because energy was spent destroying hunters rather than animals. The Hudson's Bay men took every opportunity to keep peace in the country. (loc. cit.) The Loucheux when armed were less fearful of the neighbouring Eskimos and it is probable that the long period of time which elapsed before an Eskimo trade developed was due to their distrust of all whites as allies of the Indians. (H.B.Co., folio, A/12/-1, p.455). Mackenzie valley natives therefore, accepted the changeover from their own primitive weapons to the use of firearms with only minor disruption and at first only modest interest. The change once having been completed, probably in the 1830's, meant that the aborigines were no longer independent denizens of the forested land, but now were required to make regular pilgrimages to the trading forts to resupply stocks of ammunition. These stocks could only be had by payment of fur or meat.

European Clothing.

European traders introduced another improvement into the material welfare of the Redman. This was woollen clothing. "But we now plainly, as well as the Indians, see in this climate, the great advantage of woollen over leather clothing, the latter

when wet sticks to the skin, and is very uncomfortable, requires time to dry, with caution to keep it to its shape of clothing. On the contrary the woollen, even when wet, is not uncomfortable, is readily dried and keeps its shape, which quality they admire. The Indians now fully appreciate the use of woollen clothing, and every one is glad by means of trade to change his leather dress, for one of the woollen manufacture of England." Thompson, 1916, pp.421-422). Woollen clothing was agreeable to the natives of the Mackenzie River in the summer season, but the extreme cold of winter made caribou skin clothing still essential as items of dress.

The traders had other ways to encourage Indian hunters in the pursuit of furs. In the early days grog, much weakened by water, was given to diligent hunters, but this was never very effective in the Mackenzie Region. Instead, a general harangue was delivered almost as a matter of course exhorting the Indians to greater efforts, and in the earlier days, it was usual to compare their relative positions before and after the whites came to the country. (H.B.Co., Journal, The Forks, Mackenzie's River, Dec. 6, 1823).

Tobacco.

One article of the trade became a staple within a short time. Tobacco once introduced was a favourite with young and old, and its habit-forming character tied the Indians to the white trader's desires. Tobacco, although native to America and used by the eastern Indians was not known in the district before Mackenzie arrived. The Northwesters introduced a brand

called North West Twist obtained from the United States which was most popular with the Indians and held the advantage over the Hudson's Bay Company who used Brazilian tobacco which to the natives was less desirable. (Barbeau and Wilson, 1944, p.36-39). Some tobacco came in twists or rope about an inch thick which could be uncoiled and sold in units of length - usually a fathom. Later it was made up into carrots, like enlarged cigars, of one and three pound size. The types of tobacco and methods of storage and shipment varied according to what became popular with the natives. It was used for both smoking and chewing and the smoking of a calumet or pipe was often important in the ceremonial procedures for cementing good relations. What endeared tobacco to the fur trade, however, was the addiction people formed for it; and so it became a reward for work well done. Tobacco could be given to anyone as a reward, but the traders reserved special tribute for the leading men of the Indian bands.

European "Honours" - a Stimulus to Trade.

In the Mackenzie region there was only a loose system of leadership among Indians. In times of war they would select an experienced man to lead, but at other times decisions were taken by a council of senior men (Jenness, 1961, p.391). The European traders imposed a leadership system on the area by giving prestige and honours to the men they considered important. The best hunters were designated chiefs. "On these occasions a suit of clothes is bestowed, the most valuable article of which is a coat of coarse red cloth, decorated with

lace; and as the reward of extraordinary merit, the felt hat is added, ornamented in the same manner, with a feather stuck in the side of it. Thus equipped, the new-made chief sallies forth to receive the congratulations of his admiring friends and relatives ... In the course of time, the individuals thus distinguished obtain some weight in the councils of their people, but their influence is very limited." (McLean, 1849, Vol. 2, pp.246-247.)

Credit: Basis of Trade.

Once the pattern of wants and need had been established it was with greater certainty that the men at the trade posts could advance credit in goods to needy natives. To be sure, the traders were generous even on first contact with natives and gave them goods with the expectation that Indian honesty would ensure a payment in furs. If it did not, the goods themselves almost guaranteed that native must return to the forts. Without competition, the sole trading company - in the Mackenzie region first it was the North West Company and later the Hudson's Bay Company - had considerable hold over the individual hunters. Yet the natives were not always victimized, for if they chose they need not hunt diligently and their debts piled up. The Company could not simply allow them to starve for lack of ammunitions, for instance, and there are many accounts of Indians being fed from the Fort provisions (H.B.Co., Reports on Districts, Mackenzie's River 1823-27, p.41). The Company frequently had to write off debts or arrange to have repayment a little at a time during good hunting years. By these arrange-

ments both good and bad hunters would be paid about the same, and the inequalities in hunting ability could only be rectified by the system of gratuities. Thus it was, in the autumn, credit was extended to cover an outfit for the winter hunt, and throughout the winter these debts would be repaid. The better hunters, however, received gratuities in ammunition and tobacco during the summer. (Innis, 1956, p.374). Several attempts were made to change from the credit system because it was difficult to keep good accounting, and a high price for goods was necessary to safeguard against unpaid debts. The Company has never been successful in eradicating the debt system, and after their monopoly in the Mackenzie River district ceased, new competition virtually prevented a "cash-on-the-barrelhead" approach business.

White Dependence on Natives.

While it is true that the native Indians quickly took over the tools and equipment offered to them by the traders, and became dependent upon the forts for the replenishment of supplies, it would be wrong to think that the Indians were the only people in a state of dependence. Europeans at the various posts could not have remained in the country without the help of the natives. In their system of labour specialization, no whites had much time for the production or collection of food. In the early days just after the union of the two old companies the Mackenzie district had 38 men plus wives and children from outside the country to be maintained. (H.B.Co., Reports on Districts, Mackenzie's River, 1922-23, p.3). By 1825 there were 50 men

plus wives and children. (ibid., 1825, p.7). As the complexities of the trade grew and as the posts expanded, so the number of men needed to carry out the many tasks increased. Support for these people was at first entirely from the products of hunting. Gradually there developed around the forts a group of Fort-Hunters, chosen often from among successful men and regarded by the Indians as a mark of prestige. Instead of hunting furs for trade they were to collect and bring to the forts meat in various forms common to the country. Indians other than the hunters would also trade meat but they had to be conditioned to bring it to the fort only in the autumn after the first snow when it might be kept for the winter use in a fresh frozen condition. Some of the meat was far from appetizing when it reached the forts especially if the game was first caught in a snare "where (it) may remain until nearly rotten" and the meat then buried in the ground for months before being brought in trade (H.B.Co., Reports on Districts, Mackenzie's River 1822-23, p.10). Inventories of provisions would read as follows: Fort Simpson, 3,252 fish; 18,394 lbs. fresh meat; 14,553 lbs. dry meat; 1,028 lbs. pounded meat; 958 lbs. grease; 267 lbs. pemmican; 878 tongues; 1,822 hares. (ibid., 1826, p.9). Fish were caught by the post men, but the Indians were responsible for the production of the rest of the food. The Company posts gathered stocks of provisions which could be spread over the lean seasons like spring when it was impossible to fish and the game was probably the thinnest of any time in

the year. Provisions were stored also against the failure of the hunter, and often the stock became alarmingly low. Indians themselves, having failed to store food, would offer furs in trade for the post provisions! (H.B.Co., Journal, Fort Simpson, July 16, 1824).

The New Way of Life for the Indian.

With iron tools, copper kettles, and other European goods and guns the old Indian way of life was transformed. In the first instance, the new tools released the hunter and his family from many hours of labour spent in obtaining the proper materials and fashioning their rude implements. The efficiency of the gun cut down the time necessary in the task of food gathering. Traders urged the Indians to make use of this extra time in the pursuit of furbearing animals, and they needed less and less urging as they came to value more and more the supplies from the trading posts. Gradually there took place the change from a hunting and gathering economy as practised before the advent of white penetration to a sort of specialization hunting, the products of which would bring fulfilment of the needs so laboriously attended under the old system. Yet there still had to be some of the old ways practised because Indians had to hunt their own food, and throughout the period of fur trading, the success of that trade depended upon the hunter's ability in food getting. Some animals like the beaver served both purposes, the fur for the trade and meat became a favourite food. Both these reasons led to a depletion of that animal in the region, so that conservation methods had to be introduced by the

Company about 1840's. (H.B.Co., B. 200. b. 19, p.4). Other small furbearers were not used for food, and in times of food shortage the trade in furs diminished.

It might be supposed that in the old days the Indian, operating in his difficult if not hostile environment of limited resources, was never a real threat to the wildlife of the region upon which he preyed. Perhaps there was a balance between man and nature. Periodically however, some of the ingredients of the environment failed native man and he would suffer. This happened when the rabbits somehow did not materialize and starvation resulted. It is suggested, however, that emergencies and difficulties of this sort were not as widespread as they became after white people arrived. Natural hazards, like forest fire, did disrupt the game pattern and new migrations were forced upon man as well as the animals, but the well-known fisheries at places like the Ramparts, McVicar Arm of Great Bear Lake, and Big Island of Great Slave Lake seldom failed. Sometimes the vagaries of climate worked against successful hunting, for example, little or no snow meant that the large animals like moose and caribou were hard to approach. When it was extremely cold and still, the squeak made by walking on snow warned the animals of the approaching hunter. In spite of these setbacks, man and nature were in reasonable harmony. After the natives had iron weapons and guns their keenness for the chase, an innate characteristic, was more easily rewarded, but not usually satisfied. No animal was really safe within range of a gun whether it was a useful beast or not. The simple unbridled urge

to kill was compatible with success to the trader so long as fur animals were involved. The wanton killing of caribou and moose, however, developed local shortages and probably initiated the decline in population of these animals which only became of serious concern in modern times. (Banfield, 1951).

The Native and Starvation.

The quantity of animals in the 1800's fluctuated considerably. In 1835 there was "no want of animals" in the Fort Simpson region. (H.B.Co., B. 200. b. 8, p.3). However, at the same time, in the north about the Peel, Arctic Red and Lower Mackenzie rivers there was a desperate shortage of animals for food (ibid., p.4). In 1838, animals were still scarce around Fort Norman (H.B.Co., B. 200. b. 10, p.19), and the next year at the headwaters of the Liard River the hunters found nothing. (H.B.Co., B. 200. b. 11, pp.32-37). Thus began a shortage of food animals that was quite devastating to the population. No caribou were found around Good Hope in 1842 (H.B.Co., B. 200. b. 14 p.54), and throughout the district the situations did not show improvement until 1844. (H.B.Co., B. 200. b. 19 p.74). In the same year moose were plentiful along Peel River where 10 years before the shortage of meat was acute. (H.B.Co., B. 200. b. 20, p.25). Rabbits were important before the Europeans came, to the Hare Indians in particular. They were also utilized by the Slave Indians, and in time as fur trading became the way of life, most of the Indians along the Mackenzie River snared rabbits for the staple winter meat. Naturally this dependence upon one

source of food to the neglect of other supplies tended to magnify disaster associated with the disappearance of these small animals. It was a time of abundance in 1835 when Chief Trader MacPherson reported to the Governor. "Hares as plenty as I have ever known them to be in Mackenzie's River have enabled the Indians to make good hunts throughout the district". (H.B.Co., G. 200. b. 8, p.12). Rabbits were on the decline in 1837, but there were still plenty of lynxes around to take their place (H.B.Co., B. 200. b.10. p.7). The years of scarcity were great in the early 1840's but rabbits were on the increase in 1844. (H.B.Co., B. 200. b. 19, p.74). This trend reversed in 1849 and the Indians to the east of the Mackenzie River were forced to go to the barren ground to hunt caribou. (H.B.Co., B. 200. b. 23, p.40). Once again an upswing in hare population occurred in 1851. (H.B.Co., B. 200. b. 26, p.10). It is not possible to deny that fluctuation of the rabbit numbers occurred before the Indians were taught to hunt furs. But their new way of life led to a neglect of old migration patterns and a tendency to utilize more intensively the resources, like rabbits, near to the forts where furs could be traded and ammunition obtained. Thus depletion near the forts was inevitable and starvation followed. Even the fisheries, to which the inhabitants resorted in time of need, received their share of over use and subsequently failed on occasion. (H.B.Co., B. 200. b. 11, p.6). Success at the fishery always was a seasonal feature and when the fish arrived late, or the water remained high longer

than usual, suffering for lack of food was experienced. (H.B.Co., B. 200. b. 13, p.4).

Some of the suffering by the Indians may be traced directly to their own reluctance to exert themselves so long as there was the slightest possibility of receiving assistance from the settlement. Through time the natives came to expect more generosity, but when the country was still under the single influence of fur trade, success in soliciting unwarranted aid was very slight. In fact, when the game in the country was low and food hard to get, it was in the interest of the trader to support his Indians or else they could not hunt for furs. Serious shortage of game occurred in the 1840's. Starvation and death were the result. Forest fire upset the wildlife near Fort Good Hope in 1840 and the Indians were unsuccessful in attempt to supplement their food supply with fish. (H.B.Co., B. 200. b. 12, p.4). The summer fires seemed to bode ill for the entire district because that winter the rabbits were not to be caught and this led to "death, murder and cannibalism." (ibid., p.58). Between 70 and 80 people were reported dead of starvation in the district in the winter 1840-41 (H.B.Co., B. 200. b. 14, p.5). Next winter was worse. At Fort Halkett, a report came that "by the dreadful famine of last winter, (the natives) have been almost exterminated when 100 personally known to myself perished and who knows how many more." (ibid., p.47). Thirty-seven others died of want at Forts Simpson and Good Hope. (H.B.Co., B. 200. b. 19, p.8). The latter post was even withdrawn from operation for the winter for lack of provisions. (H.B.Co., folio A. 12. 2,

p.169). Such profound misery and misfortune occasioned by the shortage of game and failure of the fishery cannot be laid directly at the doorstep of the Company. They did introduce arms, encourage fur hunting, etc., but could scarcely foresee such results. Nor could they compensate for the natives' wilful destruction and complete thoughtlessness for the future. Periods of want would still be the experience of the Indians as it had been in ancient times, but widespread starvation never was repeated in the district as the influence of the Company engendered prudence in the native mind.

Natives, White Men and Disease.

White men can never shed the blame for introducing among the native population diseases and ailments for which their physical constitution was quite unprepared. There is no evidence to suggest the environment before the white man was completely septic, for first contacts with the Indians refer to their "natural filthiness" (Mackenzie, 1902 p.234). Indians had no conception of hygiene, and they were afflicted with conditions proceeding from lack of it or from irregular and improper food supply. "Lice literally over-run all natives." (Ross, 1872, p.306). They did not have some of the contagious diseases like smallpox which, when introduced to North America, decimated the Indians from the early seventeenth century until the second half of the nineteenth. (Jenness, 1960, p.251) Mention of sickness, usually unidentified, occurs in the early journals of the Mackenzie River posts and in other sources until the present. Frequently the natives pleaded sickness as the

reason for unsuccessful winter hunting, and while some of these tales were fictitious some must have been true. Sickness and death among the natives was one reason why Fort Good Hope was removed back to Hare Indian River about 1827 (H.B.Co., Reports on District, Mackenzie's River, 1826, p.4). Influenza often laid the Indians low. "In November (1837) the Influenza was prevalent among the Indians all over the District, and indeed it was during the whole of the Autumn, but with the commencement of cold weather it entirely disappeared without any very injurious effects except the loss of the summer provision trade." H.B.Co., B. 200. b. 10, p.27). When the disease struck it covered the whole of the district, and it was sometimes fatal. The men in the forts were helpless against it. (H.B.Co., B. 200. b. 19, pp. 49, 50, 56). Some of the diseases which were resisted more or less successfully by the Europeans were much more severe among the Indians. For example a letter to the Governor of the Company in 1852 reported as follows: I regret to say that a fatal disease prevailed among the Youcon and Peel River Indians. It was thought to be venereal, but from the description I have received of it, it is pretty sure that it is the mumps, which when neglected often assumes a fatal character." (H.B.Co., B. 200. b. 26, p.114). Venereal disease became widespread in the district and many attendant conditions like eye-trouble were symptoms of this malady. (Ross, 1872, p.306). Of recent years, tuberculosis has become a common disease and it is likely that it prevailed earlier in the region but went unrecognized or was dubbed consumption. (Jenness, 1960,

p.253). Scarlet Fever when introduced to the district in 1865 spread like a grass fire among the inhabitants and before the disease had run its course, there were reports of 72 deaths by February 1866. (H.B.Co., B. 200. b. 36, p.40). By August 1868, the Chief Trader reported that 300 perished in the winter 1867-68. (H.B.Co., B. 200. b. 37, p.42). Measles proved fatal to native people in repeated epidemics and as late as 1903 one fifth of the population in the entire Mackenzie valley succumbed to the disease (Stefansson, 1951, p.26).

In the early days the Company men at the posts did what they could to alleviate suffering from diseases. They were not well prepared with medicines and could do very little but ease pain with medicinal spirits. When plagues of various sorts reached epidemic proportions the natives carried their ill and dying to the forts, because white men had the answers to so many of their needs. Unfortunately, the trader was rarely able to solve all problems. They did make efforts, and letters requesting knowledge and medication were sent to the senior administrative centres. (H.B.Co., B. 200. b. 36, p.27). Later efforts were made to have a medical officer in the district, on a temporary basis at least (ibid., p.92). Dr. John Richardson was the first medical doctor in the Mackenzie region, but his task was not the healing of the sick, nor was his time in the country coincident with any of the flagrant epidemics that the Mackenzie Indians endured. The second doctor to visit the district was Dr. John Rae. In 1849 he was in charge of Fort Simpson and

the Mackenzie Department. He had been through the country with Richardson the year before, but on this occasion, Rae never devoted his time exclusively to the health of the natives. He was a trader and explorer. Finally the pleas for a medical man were acted upon in 1867 when it was reported that a Doctor Mackay from York Factory would visit the district (ibid., p. 117). The apparent reluctance of the Company to act quickly on matters relating to the health of the Indians was not likely related to the attitude of the Governor, because healthy Indians were indispensable to a healthy trade. Part of the answer is related to the communication system. Health problems were not known by the executive powers until well after diseases had taken hold. Besides winter often saw the end of summer epidemics. It would be reasonable to wait and hope that the next season would bring an improvement. Only after repeated complaints and requests did the Company take action.

Natives: Mutual Competition and Strife.

An unwelcome feature of the new way of life among the natives was their inability to live peaceably with one another. No doubt there were disagreements in the past which were more in the nature of feuds rather than large scale warfare. The sources of irritation - mainly women- were still the same after the whites came to the country but the conditions and means to redress grievances were materially altered. Guns gave a tremendous advantage to the party which possessed them. The Cree exploited this fact early on before the traders ever came to the Mackenzie Valley. When other tribes, particularly the Slave

and Hare Indians, who were by nature the more timid of the Mackenzie natives, received guns they had a chance to settle long standing grudges for stealing women or making "bad medicine" against the tribe or individuals in it. The successful establishment of a profitable fur trade meant that such wasted energy as war had to be suppressed. Yet the traders, not venturing away from their posts, could do little but lecture the Indians. Presumably they listened dutifully, traded their fur for guns and ammunition, then went out to do precisely as they pleased! The Dogribs, for instance, were subjected to constant pillage by the Yellowknives, and their women were often taken. Gradually this constant abuse to the Dogribs provoked their courage or cunning, and sometime in the early winter of 1823-24, 85 hunters of the Yellowknife nation were massacred. (H.B.Co., Journal, The Forks, Mackenzie's River, February 29, 1824). The reports of this action were clothed in a good deal of misrepresentation. All along the traders at Simpson and Norman had warned against any actions like this because it threatened to embroil the entire east side of the Mackenzie Valley. Those Indians who would not be in the fight would depart to other places to avoid being drawn in. The provision and fur trade would suffer. The Indians probably changed their stories somewhat knowing the attitude of the Company. The warlike actions during that winter were devastating on the Yellowknives, and in the next few years they withdrew from the eastern edge of the Mackenzie region to the country near the east end of Great Slave Lake (Jenness, 1960 p.389). Reports that the Yellowknives drove

the Dogribs to the edge of the Mackenzie River in 1825 and again in 1826 were probably fabrications as an excuse for not returning to the scenes of the recent war. (H.B.Co., Journal of The Forks, Mackenzie's River, November 16, 1824; H.B.Co., Reports on Districts, Mackenzie's River, 1823-27, p.41).

Captain John Franklin arrived in the area in 1825 just after this feud and only because he wintered at the west end of Great Bear Lake, was he able to attract the Indians back to their old hunting grounds.

Other wars occurred which were neither so bloody nor so decisive. The Mountain Indians to the west of the Mackenzie River were squabbling among themselves when they first got guns. Most of these arguments were over hunting territory. A perpetual conflict existed between the Loucheux Indians and the Eskimos at the north end of the region. Traditional rivalry became unfair where the Loucheux were armed and the Eskimos were not. This partly was the reason why no trade with the Eskimos would be firmly established until the 1850's. After that time, although there were some incidents, a peace existed between the two people, but the situation was always uneasy up until the twentieth century (Stefansson, 1951, pp. 217 ff.). Elsewhere in the district, the Mountain Indians (Nahanis) were generally bullied by neighbouring tribes. This accounts for the late contact whites had with them. John McLeod's journey to the Nahanis' country in 1823 and '24 really brought the fur trade to the Nahanis and subsequent exploration in the upper Liard River gave these distant people arms. The northern Nahanis were at one time

attacked by the Hare Indians who, most likely, were protecting their hunting grounds in the vicinity of the Ramparts River and Upper Ramparts River (Jenness, 1960 p.396).

In the Mackenzie Region the northern Athapaskan Indians did not practice war in any refined way where generalship and stratagems might decide the outcome. War to these people consisted of sneaking up on the unwary foe, perhaps in the dim light of dawn or dusk, and, if possible, take the camp by complete surprise. Ambush was a favourite tactic. Hearne gives a vivid and blood-curdling description of the attack by his Indians (Chipewyan) upon the sleeping Eskimos at Bloody Falls on Coppermine River. (Hearne, 1795, pp. 145 ff.). At such slaughters no attention was paid to age or sex, the whole party usually being dispatched. "When the husbands and grown men were killed the Dogribs argued that pity impelled them to slaughter also the wives and children, who would be unhappy and perish for want, having lost their means of support." (Richardson, 1852, p.251). Such treachery was probably in keeping with the natural timidity of the Mackenzie Indian.

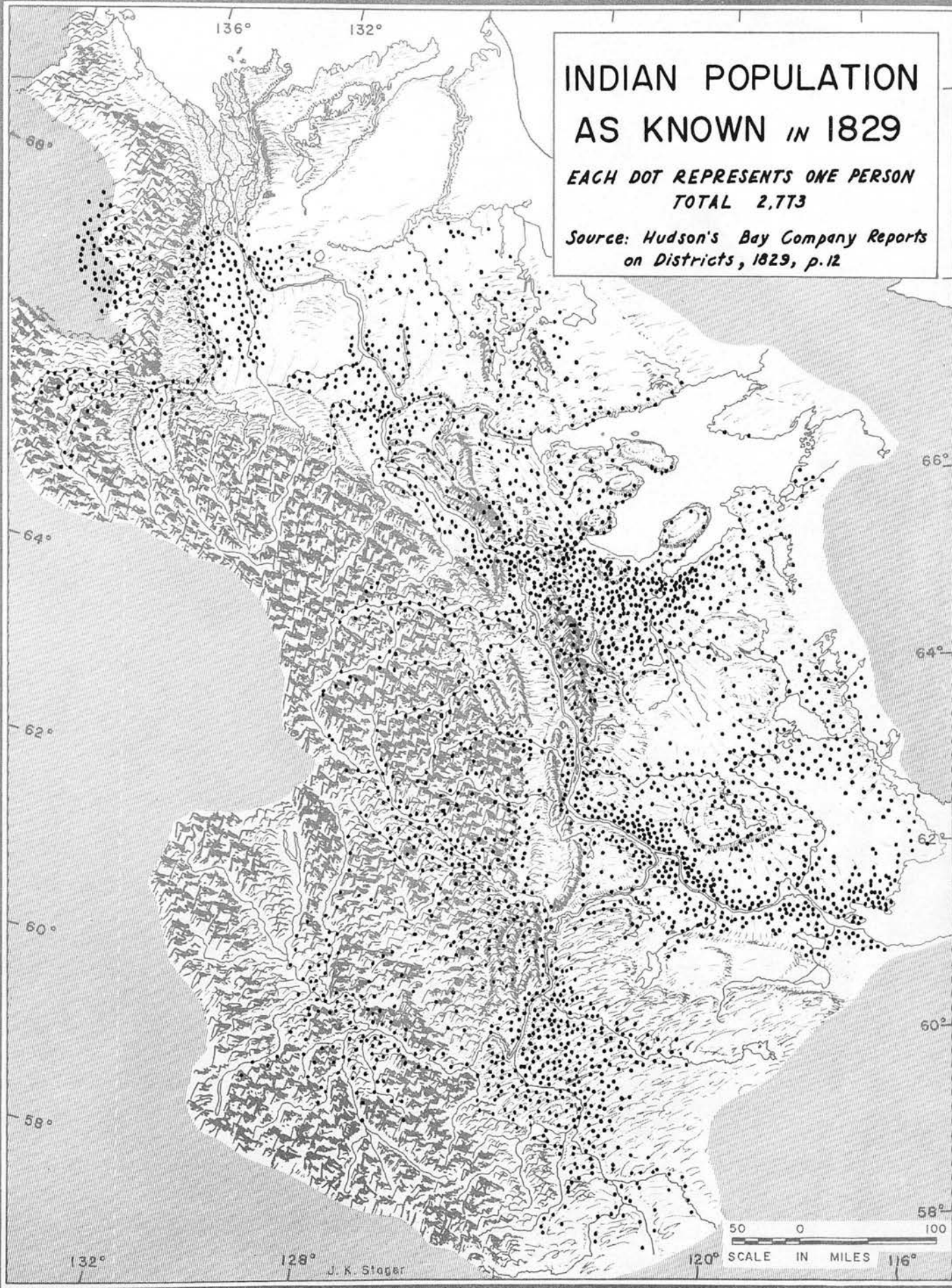
Indian Population and its Distribution

It took many years of experience in the Indian Country before a trader had a clear picture of the district, because he had rarely the opportunity to leave his post and depart from the main highways of the trade. Some of the men travelled to the Indians or trapped on their own, but the man in charge had to build up his picture of the district gradually from Indian

INDIAN POPULATION AS KNOWN IN 1829

EACH DOT REPRESENTS ONE PERSON
TOTAL 2,773

Source: Hudson's Bay Company Reports
on Districts, 1829, p. 12



MAP 31.

INDIAN POPULATION AS KNOWN IN 1829

This map should convey a general impression of the distribution of Indians because these people led a migratory life. Based upon a census at the trading posts, the concentrations take account of the country most favourable to the new way of life based upon trapping, hunting and fishing.

intelligence and his own good sense. This applied also to the knowledge of the people within his district.

It was general, in the early period of the trade, not to bring families to the forts, although they sometimes came for reasons of sickness or starvation (H.B.Co., Reports on District, Mackenzie's River, 1822-23, p.4). As the leaders of the Indians resorted to the forts and were recognized as leaders, they soon were able to give a close notion of the total numbers of people in the country which they inhabited. The first real census of the district was gathered in 1829 (Map 31). The method probably used was simply to sit down with the chiefs and go through the community, tent by tent, relating the numbers inhabiting each. The total number in 1829 was 2,773. (H.B.Co., Reports on Districts, Mackenzie's River, 1829, p.12). If in error, this figure would be an underestimate rather than overestimate because of ignorance of outlying territory. (Also the general distribution could vary greatly because of the migratory life of the people. For instance, when Franklin's expeditions were in the region, Indians hunted in the edge of the barren ground to the east of Great Bear Lake. At other times the people kept closer to Mackenzie River when they feared the attacks of the Yellowknives.) There was general concentration of people on the plateau country to the south and east of the lower Liard River. The Slave Indians here trapped energetically in the lands drained mainly by the Fort Nelson and Petitot Rivers. On the Mackenzie, the Slaves liked to concentrate along the banks of

the river depending heavily upon fishing. There was a higher density around the end of Great Slave Lake where the fishing was reliable and extended over a long season. There was also a concentration around "the Forks," Fort Simpson, that likely grew in time due to the desirability to be near the source of white men's supplies. Other bands of Indians frequented Horn Mountain and Marten Lakes areas. Southwest of Great Bear Lake many of the Dogrib Indians that resorted to Fort Norman hunted profitably in the low, ice-scoured plains which are dotted with lakes. Besides, the fishing on McVicar Arm of Great Bear Lake was a reliable attraction. These people did not cross the Mackenzie River in numbers, partly because of the Mountain Indians and partly because the plateau nature of the plain opposite Fort Norman had few rivers and no lakes of consequence. Indians nearly always liked a reasonable source of fish nearby, and the Mackenzie River in its middle stretch is not particularly productive. Thus the middle Mackenzie River and the area west of it were not visited often. North of Fort Good Hope - in 1829 it was located in the same place as it is today - the population was sparse as shown on the map. This is in contrast to several early reports that numerous Hare Indians, for instance, occupied the lands north of the Great Bear Lake east of the Mackenzie, and the region around the Ramparts River. (H.B.Co., Reports on Districts, Mackenzie's River 1822-23, p.6).

The northern extremity of the Mackenzie region was imperfectly known, and remained so until the second half of the

nineteenth century. The concentration of Hare Indians along the Mackenzie in 1829 was probably due to the Fort at Good Hope and to the good fishing at the Ramparts. In the basin of Ramparts River are thousands of small lakes that make suitable beaver and muskrat country, and commanded the attention of the natives once the traders had shown what these furs would purchase. The Loucheux Indians of Arctic Red and Peel Rivers were on good relations with the Hare Indians, largely because they had contempt for the Hares and the latter did nothing to dispel such judgement. Loucheux hunting grounds, after the trade arrived, were concentrated about the two rivers previously mentioned. The Arctic Red River, in its middle course, flows through low ground on which there is a high concentration of small lakes, and therefore, good beaver and muskrat terrain. From the Peel River some bands ranged over the edge of the Peel Plateau, and in the upper Peel, Loucheux Indians hunted in the Bonnet Plume basin and along other tributaries to the southwest. The census of Indians for this country shows a small number probably because of incomplete knowledge. The Indians hunting on the Peel River at the delta and west of the Richardson Mountains probably ranged west into the Old Crow Basin of the Yukon Territory, and were much more numerous than shown. (Jenness 1960, p.404). In 1829 the Nahani or Mountain Indians seemed to be few in numbers. But they were still the shy people of the district and had yet to be encouraged to make full contact with the Company posts. Fort Halkett, built for the Nahanis in 1829, had scarcely time to get a good record of their numbers. No Indians are shown on

the map in the region of the north Mackenzie Mountains. No doubt this section of country was hunted, but at the time of the census, this area was one about which there was no knowledge. The population in the mountainous country is shown distributed along river valleys because the valleys were the routeways through the rugged terrain. The Indians did, no doubt, hunt into the mountains as well.

Life in the Indian Camps

Seasonal Activity of the Indians Before and After the Coming of the Fur Trade

Winter

Winter is a long season in the Mackenzie region especially if one includes the autumn frost and snow before the deep freeze of true winter sets in. Also the reluctant arrival of summer adds many days that truthfully could be described as winter in some more civilized sections of the globe. With winter are associated most of the disagreeable climatic characteristics against which native man exerted his energy and his intelligence. Very low temperatures, on the average -10° to -20° and lower, demanded the greatest adaption. Caribou and moose skin (hair on) garments plus a blanket of the same material kept the travelling Indian warm. His tipis formed of brush or skin and banked up with snow could be unbelievably warm with a small fire even at the coldest season.

Although the struggle against low temperature could be solved, this climatic characteristic did affect the activity of the Indians. When temperatures were extremely low and accompanied by

a wind it was senseless to move beyond the campground. A man could not endure the wind at such low temperature without freezing his face. When the wind did not blow, the very low temperatures made it difficult to stalk game animals like moose and caribou, and bitter cold rendered winter fishing an occupation painful to the hands. Snow cover was both a help and a hindrance to daily life. It was a good insulator and used for that, and it was melted down for water needs. After a fresh fall tracking of animals was possible, but with the light snowfall of the valley - on the average there are fewer than 50 days with snowfall of a total of 200-240 days with snow cover - meant that on most days the ground would have a confusion of animal tracks. Nor did the snow pile deep in the forests. Some years it would be deep and the Indians on snow-shoes could move easily over the surface to catch big game lunging through the snow. Normally Indians could not expect to use this mode of hunting until nearly spring. Most of the winter the snow was soft and undrifted within the trees, so that travel even with toboggans was not engaged upon lightly.

Throughout the winter the sun, when visible, was always low on the horizon^z and daylight hours very short. Even in the Liard basin about 60° North latitude the December daylight lasts barely six hours. In the hunting grounds of the Loucheux and Hare Indians not even four hours are light. The combined effect of those winter conditions was to cause the natives to curtail severely their mobility. Yet the need for food sometimes meant they had to move. It was up to the hunters to find in the

autumn an area where big game was in sufficient quantity that the people could form a permanent winter camp. The Slave Indians of the Liard might find woodland caribou along the Fort Nelson River or some such locality, and the Dogribs knew if the winter was severe the barren ground caribou came into the "strong woods". Slave Indians of the upper Mackenzie depended greatly upon the winter fishing along the river and at Great Slave Lake, while the Hare Indians looked for plentiful signs of rabbits.

Wherever game was plentiful, many Indian families would gather. In the native society, the availability of food was open to all comers and if one hunter was successful he was obliged to share with an unsuccessful man. Thus in the winter many tipis might be gathered together at a good source of food, and those who were not inclined to hunt conscientiously could dip their hungry hands into the communal pot. Also large gatherings of people were better suited to the favourite pastime of dancing and in this way the cold lonely season could be enlivened with some sociability. During the daylight hours, if the weather was fit, men would be out visiting or re-setting rabbit and caribou snares, and if he was successful in collecting game, he might bring a portion home and send others in the family for the remainder. The women, and older children, were kept busy gathering firewood, tending local snares, and with other necessary domestic chores. On days when strong wind or intense cold prevented hunting, men would remain in the lodges where eating and sleeping occupied much of their time. They

would also have to keep their armaments in repair. Hunters spent time fashioning arrows, spears, shaping snowshoes or toboggans, and in other crafts required to convert the elements of their environment to useful tools. Women generally did the leather work and extracted the many useful items from the products of the animal kingdom. For the most part, however, it may be considered that winter, cold and dark, had an effect upon the aborigines not greatly different than most of the animals, viz: a slowing of the pace of life compatible with maintaining health and happiness, and a minimum of exertion in outdoor activity.

The fur trade did very little to alter the habits of the natives in winter. From December until March Indians subsisted at the best hunting ground in the quiet manner described. Perhaps there were some efforts to collect furs and the odd wooden trap for martens might be set, or if there were beaver about, an Indian might take a trenching tool or chisel and cut into a beaver house but as much for the flesh as for the pelt. The principal difference in the winter life after the fur trade was the release from some activities like arrow and spear manufacture, or net weaving from willow bark. No more axes needed to be made when they could be purchased. Just before the intense cold of the true winter began the Indians would have reached the winter camp with supplies from the trading post. These supplies consisted mainly of ammunition and perhaps a blanket or two and tobacco. A native could, with his gun, stalk more easily the unwary moose, or upon spying the steam vapour

from body heat rising above a herd of caribou, might with his deceptive methods get among the animals before discharging his gun several times for several kills. Life in the lodge would be changed to the extent that tobacco smoke was added to the smoke of the wood fire, and the time gained from not having to fashion implements was probably added to the activities of eating, sleeping, and conversation rather than hunting or trapping. The fur trade may have had an effect upon the location of wintering grounds. Traders would ask Indians to hunt certain areas and may have succeeded in having some family venture into new lands. By their own initiative, however, the Indians were reluctant explorers beyond their known territory. The advent of fire arms and subsequent local wars between bands disrupted the natural pattern of migration to winter hunting grounds. This occasionally brought starvation and a retreat to the nearest post for succour. Basically, however, winter was much the same before and after the coming of fur traders.

Spring.

Although temperatures continue to be below freezing and the snow cover persists, in March, April and into May there is a very noticeable change in temperature from the extreme cold of winter. Characteristic also is the increase in the length of day and, as the days become longer and warmer, the snow surface begins to melt in the direct rays of the sun. At night or when the ground is shaded from direct sunlight the snow refreezes and develops a crust which makes a very considerable difference in the ease of

movement over snow-covered terrain. In winter the snow is light and even with snowshoes travel is slow, but the spring crust supports a man on snowshoes very well. Such conditions were distinctly to the advantage of the hunters and, with the lengthening days, Indians responded to the awakening season and sought to make good on the hunt. Moose and caribou could be challenged directly in deep snow, for the crust would not support their weight, and it was not necessary to proceed on a patient and stealthy hunting operation. Thus, in this season Indians were able to take many animals, perhaps more than their immediate food needs might demand. New hides, once tanned with brains, dried and pulled until soft, were welcome as material for new summer clothing of chamois-like leather. Women became busy making or repairing summer garb, completing every step of the process from taking the skin from the backs of the caribou or moose until they were on the backs of the members of their families. Extra meat, if there was any, was cached in woods either in an elaborate wolverine-proof stage raised off the ground or suspended by a babiche rope from a large tripod or convenient pole stripped of bark to prevent animals from climbing up to the cache. Some meat, carelessly covered with logs on the ground, might be dragged away by wolves or other predators. The spring lodge had much a less snug, relaxed atmosphere than the winter home. There was eating at all hours, for the Indians ate when they were hungry, but there was less sleeping with longer daylight. Hunters, with at least 12 hours

of daylight travelled more widely in search of game and spent more time in the chase.

In April and May as the spring melt advances, the snow becomes soft and melt water drains through the snow to the ground which beneath in turn begins to thaw. Thus deep, wet snow and soft ground virtually halted extended travel until the snow disappeared and conditions were somewhat drier. Under these circumstances it was no longer possible to run down the deer and food was hard to get. Cached food helped to sustain the native during this period of immobility. Late spring was the time of the year when food was scarce. The rivers were high after break-up and the turbulent waters were charged with drift-wood which could carry away any nets set in the stream. Fishing for food had to be done in the lakes and it was not always good because high water conditions occurred in the lakes too. If spring break-up was extended in time by a short period of re-freeze then there would be hunger from the inability to hunt and fish.

Indians decided about April if they intended to migrate before the complete break-up of the winter. The decision was based upon the means which could support them during the lean spring period. Most of the natives for convenience of travel lived reasonably near some river course although they may have moved away inland following game during the winter. The Mountain Indians and those along the Mackenzie and Liard rivers certainly were never far from the water highway. Some of these may have

repaired to a fishing lake nearby to await break-up, because the Slaves, and Hare Indians, particularly, depended greatly upon fish. Usually the break-up days were well utilized in preparations for summer. To make canoes for summer travel the women were required to do the task of "rising bark", which was from birch trees in the southern part of the district and spruce farther north. Men spent their time shaping, sewing, strengthening and tarring the new crafts. It is doubtful if the Mountain Indians engaged in this boat building, because the streams they followed were so capricious in their flow characteristics. Besides the game they sought moved opposite to the river flow to higher elevations as summer approached. Some of the Slave Indians east of Horn Mountain, the Dogribs around Great Bear Lake and Marten Lakes, and the Yellowknives on the edge of the Canadian Shield were people who followed the barren ground caribou, and like these animals, were compelled to be on the move before the snow and ground became soft. The caribou migrations north towards the barren grounds began as soon as the intense cold vanished and it was no longer necessary to have the protection of the forest. The natives followed them to the edge of the woods but rarely very far beyond because they had not learned to provide fuel on the treeless tundra. Sometimes they carried wood fuel for short journeys on to the barrens, and at other times local willows and moss were scraped together to feed small fires, but the fuel problem was the main limitation to Indian migration. After the break-up of rivers and lakes, caribou migration routes

converged on narrow crossing places of the water bodies, and once known to the Indians, they became favourite gathering places. Animals caught in the water were attacked and easily slaughtered by men in canoes. Even in pre-European times there seems to have been wholesale butchery and once surfeited with meat and hides, little else was taken except perhaps the tongues, a great delicacy.

The fur trade decidedly changed the old spring routine. With the first signs of relief from the very cold winter, one or two hunters from each family or group of families travelled on snowshoes to the nearest trading post. Sometimes they would drag the toboggan with a few furs taken during the winter, and trade at the fort for implements or ammunition. More often, there were no furs to trade and the March visit to the post was simply to get an outfit for the spring hunt. This meant, usually, that the trader gave supplies on credit and hoped he would be paid later. The practice of resorting to the forts was taken up first by the natives along the Meckenzie, notably the Slave and Hare Indians. The Nahanis remained secure and independent in the mountains until traders sought them out by going into the mountains after them. The Dogribs and Loucheux were slow to succumb to the attractions of fur trade, but in time, they too sent men to the forts for spring outfits. At first the traders desired the Indians to hunt beavers but also indicated interest in marten, mink, otter, lynx, muskrat and other fur bearers. Normally the Indians did not often kill any of these beasts as they provided nothing significant to the Indian way of life. Now, however, they learned to eat beaver, lynx and

muskrat and save the pelts for barter. The spring was active enough during the old days, but the activities of the season were accelerated from those of pure food hunting to fur hunting. The Indians with their new iron tools could cut into the lodges of the beavers and breach their dams quite easily. In the Mackenzie region the trenching tools were not adopted immediately because the natives were successful enough in catching beavers with the aid of their babiche nets. In the Loucheux country of the Mackenzie delta and Peel River similar techniques were employed in hunting muskrats. Here Indians did the same on the Rampart River. In the 1830's and 1840's there were moves on the part of the Company to restrict beaver hunting as a conservation measure when it became noticeable that certain areas returned fewer and fewer beaver skins. Fur specialities developed in favious parts of the Mackenzie region. Areas with many small lakes like the delta and Ramparts River basin were good for muskrats and one band of Loucheux were known as the Rat Indians. Much of the rest of the basin returned many marten furs, partly because the Company encouraged the trapping of these animals. When the beaver population dropped, the spring hunt was turned towards the martens. To catch them, the Indians for a long time used their own method of a wooden trap arranged in the manner of a deadfall and baited with a bit of meat, fishhead, or more common in late spring, heads of ducks and geese. The Indians also set snares for lynxes and arranged deadfalls for foxes and, to a lesser extent, for game like wolves, mink and ermine. Indian men and boys busied themselves with the fur hunting and the women

remained in camp skinning and stretching the hides as they were taught by the traders. The methods of stretching were devised pretty much by the natives who used large hoops of willow wood to stretch beaver skins or small branches over which the small skins, like muskrat, were drawn inside out. At first the quality of the fur and the way in which they were prepared mattered only slightly to the trade. But in time furs were graded, and it was difficult to convince the Indians that grading was valid. To them one skin was like another and they expected to receive the same value in trade.

In the early days of trade the spring fur hunt was a relatively easy and profitable vocation in addition to the usual activity of the season. Fur animals were plentiful and available in the same locations where the Indians spent the winter. When the desire became strong to have a wider range of white man's goods the hunting intensified and areas which could support the natives' simple desires could not match the white man's apparent needs. Areas became hunted out and this led to mobility of the Indian camp, so that even the least ambitious hunter was forced to move. The best and most aggressive hunters were attracted to other locations by the prospect of richer returns before being forced away by diminishing fur-animal population. These men could see that in their society where food and shelter could never be denied a less fortunate companion it was useless to amass a large store of food because his neighbours would simply help devour it. The return from the fur trade, however, was quite another matter. Beads were not shared, but garnished the costume of the hunter

and symbolized success in his endeavour. Tools, cloth, a better gun, etc., were all items that were not shared and ensured that the reward for individual effort went to the individual who made it and not to the group. Thus the more sociable gatherings of many Indian tents at the winter hunting grounds were certain to break up into family groups widely dispersed so that each hunter might have more area in which to trap and, therefore, have a greater chance of personal success. If the winter hunts continued to be in part communal, then the spring season was marked by dispersal of the tents as the temperature of the air grew milder. Such movement about the countryside had to take place early in the spring before break-up period effectively curtailed any migration.

Summer.

After the break-up month of May, warm temperatures of summer invade the Mackenzie region during, June, July and August. Most of the region experiences temperatures that reach to 70's on many summer days and mean temperatures of 55°, 60° and more are the usual conditions. It is not as warm near the Arctic ocean and local temperatures near the Great Lakes in the Mackenzie region are considerably modified by these water bodies. Cool air drainage into the bottom of the valleys made them somewhat cooler than the benches or uplands nearby. With the warmer conditions the Indians were able to change their winter costume for light leather jackets and leggings without the hard cover, and it was not necessary to carry around a heavy skin blanket for warmth. Indians used their canoes in search of food. It was

much easier to paddle along and hope to spot a moose by the stream or lake than to walk through the forest on a similar mission. Canoes, the large travelling sort, were used in migrations which took place in summer. Once the water had subsided after the spring flood, the Mackenzie River had several places where fishing was good. The Hare Indians gathered in numbers at the Ramparts to catch white fish and inconnu, particularly river herring which were abundant at that location. Other bands of Hare Indians fished on the edges of Great Bear Lakes. The Dogribs were not partial to fish and preferred caribou meat, but when the caribou migrated beyond their range, they, some at least, also subsisted on the fishery of Great Bear Lake. The Slave Indians found sustenance from fish along the Liard and upper Mackenzie Rivers, and the Big Island fishery at the west end of Great Slave Lake was a summer camp ground for many families. Some of the Loucheux fished in the Peel, Mackenzie and Arctic Red Rivers, but many followed the caribou on to the higher ground or even north to the coastal plain. Most of the fisheries did not last the entire summer, so families might have to move two or three times. The Nahani Indians followed and found their game, woodland caribou and mountain sheep, up in the high alpine pastures. Everywhere in the Mackenzie region the Indians would stalk the wary moose and when the flies were bad, they might be successful in catching this animal submerged in water to avoid his tormentors. A special feature of the beginning and end of summer were the migration flights of hundreds of thousands of birds to the region. The

woods and lakes became alive with their activity. Of all the birds water-fowl were the most important to the natives, because the ducks and geese confined their activity around water bodies. This natural nucleation of the game was a great advantage to the natives and each year on the northward flight and again on the return southward these birds made a welcome change of diet. On many lakes and rivers the water-fowl chose to remain for breeding and moulting and were game birds for the entire summer, but many Indians, notably the Mountain Indians, enjoyed this food diversion mainly at migration times.

Summer lodges varied throughout the region. Those natives who had many caribou or moose skins could built tipis and clothe themselves with hides. The Dogribs and Yellowknives used skin tipis and the Loucheux built skin covered domes or hemispheres. Other lodges were made of poles and perhaps "shingled" with bark. Often summer dwellings were simple lean-tos to break the wind and shelter the inhabitants from the rain. This latter type of shelter was used by the more migratory Indian people, mainly the Nahanis.

About the camps the scene was one of activity almost any time of the day. Just as in winter when the short daylight period gave rise to restricted activity, so in the summer months the long days meant people would rest or sleep whenever they became tired rather than at a set time. The same applied to eating, always a function fulfilled whenever hunger called provided there was food available. Men, as usual, were occupied bringing home food. They tended the nets going out in small canoes, or if the fishing

was poor, they were engaged in finding a more suitable site. Men also, reading the signs of nature in the forest, trailed and killed moose or woodland caribou. Among the aborigines of the Mackenzie Region the men did some work reserved in other Indian tribes for women. Men helped to build the lodges or gather fire wood for their wives. Women as everywhere, were busy with children and preparation of food. Not unlike the role of some modern women, the Indian wife had to keep clothing in repair, but she might also have to repair or make new fishing nets or willow bark. She would also cut meat into strips and hang them out to dry preserving the flesh for future use. Fish were dried, and both fish and flesh were sometimes smoked.

The long days and long time of wakefulness meant that the natives had more time for the making of tools and implements. It was probably during this season that they did most of the craft work. With a canoe or on foot it was possible to examine the banks and shores of the rivers for the appropriate type of rock useful for striking fire, tipping arrows, or making adzes or axes. Unless a specific source was known, it was difficult to collect these raw materials in winter. Growing trees provided green wood that was springy and from which the natives could make his stretching frames or bows. In summer men collected ochre from the burning coals near Fort Norman or black stein from the peat or coal exposed on the Liard River or elsewhere in the region for dye purposes. Women boiled up a dye from the alder tree to give a yellow hue for decoration purposes. Thus spare time was given to fashioning of tools and

implements or in decoration of the clothing or person. Near the end of summer the wild fruit appeared and women or children occasionally supplemented the family diet by gathering some.

Summers after the fur traders came were not greatly altered. Men continued to take their families to the fishing places or up in the mountains to follow game, and the women pursued their usual domestic chores. The prime difference was that they had iron and steel implements from the whites with which to cut, carve, chop and sew. The traders also brought twine to make nets, bind implements, etc. Guns, of course made moose hunting a less subtle task and reigned terror on other animals like the bear which were not normally bothered by men armed with spears and arrows. When guns were first distributed among the Indians some did not learn the skills of marksmanship very well. Early traders despaired of the Loucheux ever being able to hunt moose with the new weapons. Some summer hunting for furs was practised by the natives. They shot muskrat and beavers from canoes when they could, but more often they drained the ponds in which these animals lived, because neither animal could move quickly out of water.

If the early summer hunt was good, and ammunition still held out, the natives delayed their return to the trading posts. Usually however, in June after the break-up the Indians, mostly men, travelled by canoe to the post to repay debts incurred by the spring outfit. When moose and caribou were scarce, the Indians had no time to trap furs and debts remained unpaid or even enlarged when necessities were dispensed by the trader. On

the other hand, if the fur hunt was good, debts could be cleared away and perhaps some credit was left over for extra beads, a new knife or another gun. The spring trek to the posts made a greater difference to the Nahani Indians. Formerly they were not concerned with travelling beyond their mountain homes, but on the pilgrimage to the forts they had to pass to the plains. Only Fort Halkett could be called a mountain country fort. To bring their furs out the Nahanis built boat frames of wood and covered them with moose skins. The boats they guided down the mountain rivers just after the snow melt at high water to carry furs to trade. At the forts both furs and moose hides were traded, the latter always being in demand for footgear. The Nahenis with their new supplies of ammunition and other goods packed their way back up the mountain tributaries of the Mackenzie, walking on the gravel shores and bars that were newly exposed when the water levels dropped. These natives who previously never used boats now used them regularly.

With the completion of the early summer trade the natives were given gratuities of ammunition and tobacco in amounts commensurate with their trapping success. None were ever left out because Indians must at all times have the means to feed themselves or else they could not trap furs. Once the formalities of trade had been observed, the hunters repaired to their summer stations along rivers or lakes to fish, to hunt for their families. The traders were not often successful in urging the Indians to hunt furs in summer. Such activity robbed the hunter of his independence, and so long as his needs

were satisfied at the trading post, he was content to tend nets. Actually, this lack of desire to trap furs later worked to the advantage of the Company. At first the traders were wont to castigate the Indians for indolence. But furs are in poor condition in summer, and with more and more quality demanded by fur buyers, the Company discouraged summer trapping. This respite allowed a better survival and replenishment of animals. Near the end of summer, however, hunters once again journeyed to the fur trading post.

Autumn.

After the autumnal equinox the days in the Mackenzie region became noticeably shorter. With the approach of winter changes in temperature and frost become common. In early autumn some of the Slave Indians shifted their camps to the spawning grounds of the whitefish at Great Slave Lake, and on McVicar Arm of Great Bear Lake the Hare and Dogrib Indians gathered for the same purpose. Elsewhere the outer Hare Indians, Yellowknives and Dogribs moved to the edge of the forested zone about the time of the first snowfall in anticipation of the southward migrating caribou. Autumn was in part a season when preparations were made for winter. During the months of September, October and November many Indians were on the move in search of the best hunting areas at which to spend the winter. The Nahanis and others who preferred flesh to fish were the most active in search of game. The fishing bands remained by the water so long as it was productive. When game was found to be abundant, there would gather several families to hunt, and with success

the caches of meat were secured against marauding beasts for winter use. As the temperature dropped below freezing, beginning in the north in September and progressing south until Great Slave Lake had below freezing temperatures at the end of October, the Indians could preserve their food in a fresh frozen state. Not that this was desperately important because fish or flesh in varying degrees of decomposition were eaten with relish.

The changing season involving freeze-up of lakes and rivers is not the same handicap to travel as the season when break-up occurs. Frozen ground improves travel, and enables swamps and muskeg areas to be crossed easily. Small lakes and ponds which generally freeze over first, when frozen shortened and facilitated foot travel. Still the large lakes and major rivers remain open into November in the southern parts of the region. Canoe travel is possible quite late in the season, so that transport of most of the family and gear to far off winter quarters could be by canoes. The chosen site for winter living had to be reached before the final freeze-up of the rivers, an event which could take place quite quickly and was liable to catch the Indian and his family unprepared. Any delay due to freeze-up was short lived because once set, the ice became sufficiently solid for travel in a few days. Of course, unexpected mild weather occasionally reversed the process for a day or so. The natives who did not make constant use of the rivers for transport, like the Nehanis, left their long journeys until the rivers were frozen and used them as highways. Following such

routes they hauled their toboggans loaded with belongings to the hunting ground chosen for the winter season.

Autumn activities at the campsites were directed to preparations for the colder weather and winter travel. Women, still with the normal tasks of cooking and caring for the family, were also busy with the preparation of winter clothing. To do this, hunters would have to provide many caribou hides and even the Slave Indians who lived on fish were moved to hunt for moose or caribou skins for winter. This autumn hunt was part of the general activity of the hunter trying to find a suitable winter hunting ground and trying to build up a cache of meat for the short winter days. The Hare Indians, on the other hand, made their winter garments from strips of rabbit fur woven into blankets and fashioned into clothing. Skins collected over the summer and autumn were used for this purpose.

The men also had preparations to make for winter and gathered wood suitable for the making of snowshoes and toboggans. The green wood they steamed and bent into the proper shapes, and presented the frames to the women who laced the shoes with babiche or rawhide. By the time the rivers and lakes were frozen and the countryside clothed in a snowcover most of the natives had found the place where they would remain for the winter providing the game and fisheries continued to give satisfactory returns. By the end of autumn sturdy winter lodges had been built in anticipation of the deep cold of winter.

Once the Indians had seen the baubles and implements

offered by the white traders their autumn activity became directed more and more to the trapping of furs that were the means of satisfying their new desires. The autumn hunt developed into the most prosperous beaver season. As furriers became more particular about the products they purchased, it was necessary to take animals when the pelts were prime. This occurred when the fur thickened for winter protection. Furs of other animals like fox, marten, mink and lynx were also prime and desirable in autumn. With the first cold weather of September and when the first snowfall showed up animal tracks, hunters made their way to the trading posts for hunting supplies, mainly ammunition. There were occasional difficulties in supplying the Indians at this season if the stores of goods had run low. No replenishment could be expected before early October when the brigades arrived back from Fort Chipewyan. Thus if Indians could be outfitted immediately they returned to the beaver swamps and lakes, but if not, they had to be content to fish and wait until the new goods arrived. Such a delay may have meant a good portion of the trapping season had been squandered. While the hunting was in progress, there were hunters of every range of success. Even the best, who were generously rewarded with extra gratuities and perhaps a chief's costume, were always urged to do better, and those who were poor hunters became the pitiable object of derision on the part of the traders. The hunt usually continued until the ice covered the major lakes and ponds at which time the Indians had to be sure they were either at the place they decided upon for

winter residence, or that they had time enough to move by canoe to the selected locale. With the furs trapped before freeze-up, hunters made their way to the forts either packing the loads on their backs or bringing them on toboggans or sleds. They could then purchase lengths of cloth or blankets which would substitute for the caribou skins they failed to hunt while trapping furs. It is notable that toboggan transport of the Indians was changed upon contact with the whites, and although they continued to use the toboggan, the traders taught them to use dogs to drag their loads. The dog cariole rapidly became the accepted means of winter transport, and while it offered an easing of the manual labour, it required a greater production of food to support a team of dogs. Thus, it seemed that the autumn season was given over almost entirely to activities in support of the fur trade. Besides fur there was a brisk provisions trade in this season. Caches of meat were collected, and the least desirable cuts traded into the provision store of the forts. In spite of encouragement to trap fur and trade provisions, Indian hunters saw to it that they and their families were provided with food. If food was scarce, then there would be no fur because the native could not give his attention to foreign activity without a full belly. In time, of course, as it became clear that the forts could not refuse to help people who were absolutely destitute, this assurance led occasionally to indifference and laziness in hunting. Ruses of imaginary illness, bad hunting or unfavourable weather conditions were used against the traders by Indians who were in their way quite as canny as the

Scots who managed most of the posts. The advantages in the trade were not always one way.

Life at the Trading Posts

Food Supply (local).

All the cunning and resources of the white man were not enough to free him from the compelling rhythm of the seasons. The food supply in the country varied in kind and quantity as winter passed to spring, summer, autumn and back to winter. Most of the hunting for meat was done by the Indians who traded it along with furs at certain seasons. Usually the system evolved whereby the good hunters in the district were rewarded with the single task of hunting for the forts and receiving their necessities in return. This was more satisfactory than collecting from the Indians all the inferior cuts of meat which were offered in trade most often. Sometimes the men of the posts would find time to hunt. In winter when the activity of the forts was reduced, men might, on fine days, indulge in hunting or trapping, but they did this as Company employees and their success was counted as a Company gain and never a personal one. Serious hunting for food, however, never became a white man's task because game in the immediate environs of the posts had long since been depleted below the level of fort support, and food could be had only by travelling. The trader and his men could not remain away from their trading stations for extended periods of time. One food-getting technique was practised within range of the posts, and it was fishing. The fishery was tended all the year around with

slight interruptions when the ice broke-up in the spring and when freeze-up occurred in autumn. On large rivers like the Liard and Mackenzie the spring break-up delay was longest because of the high water bringing ice and driftwood downstream, both of which were damaging to nets. The large posts like Fort Simpson had men employed solely as fishermen and they worked the Mackenzie River upstream to the Big Island fishery. In time, this fishing station became a relatively permanent post but mainly for fish production. The men at the smaller places like Forts Norman or MacPherson had net-tending as part of their other chores, and when duties permitted, a few might be sent to a nearby fishing lake to devote all their energy to this activity.

Gardening.

To supplement and enlarge the dietary monotony of fish and meat, the Hudson's Bay men devoted some of their time to agricultural activity. Natural limitations of climatic origin were responsible for any gardening to be accompanied by a large element of risk. The environment was not all that hostile, particularly in the southern half of the Mackenzie region. Recent records show that the length of period without frost is on the average more than 80 days along the upper reaches of the Mackenzie River and in the middle Liard region (Map 13A.) Even Great Bear Lake and the delta of the Mackenzie have more than 60 days frost free, but posts like Forts Good Hope and Norman can not expect as many as 60 days without frost. Most of the region has a growing season of over 100 days, and in the upper

Mackenzie it is longer than 120 days (Map 13B.). The apparent anomaly of 120 days for growing but only 60-80 free of frost is partly explained by the long hours of daylight which may turn a day beginning with frost into a growing day by raising the mean temperature above 42°F.

To begin with, the posts had only small areas cleared, and the men planted potatoes and turnips for vegetables which could be stored and kept from freezing. The potato at least, provided its own seed. (H.B.Co. Journal of the Forks, Mackenzie's River, 1822-23, 24 May 1823; 9 June, 1823). In the 1820's the Fort Simpson post was starting cabbage in a cold frame and transplanting them later to the garden. They also sowed large plots of barley which is noted for its rapid maturing qualities (ibid., 12, 15, 20, 21 and 27 May 1824; 23 and 24 June, 1824). One year they attempted to add wheat to the crop, but without success (ibid., 10 October, 1825). Curiously enough the uncertainty of crop success was due more to summer drought than shortness of season or cold temperatures (H.B.Co. B. 200. b. 30. p.34). Fort Simpson and Fort Liard, then later Fort Halkett were the most reliable agricultural stations and surplus produce made its way to Fort Simpson to be redispached downstream to Forts Norman and Good Hope. Gradually as the firewood was cleared from the areas next to the trading post it became easy to clear large tracts of land, and Fort Simpson had the largest cleared area. There was virtually a small farm. In 1836 cattle were brought to the Mackenzie region. (H.B.Co., B. 200. b. 8. p.38). This enlarged the activity of the post managers for they then had

to gather and store hay to sustain the animals over winter. Hay barges worked along the shores of the upper Mackenzie and Liard rivers to find and harvest from natural hay meadows near Fort Simpson and Liard. Hay and grain were difficult to supply in quantity and the long winter caused other problems of cattle care. "You state that the young cattle (at Fort Liard) are miserably poor, this I suspect originates from proper attention not being paid to cleanliness, for unless that is done, depend upon it, neither horned cattle nor horses will thrive; so look sharp after your stable keeper and see that he attends most strictly to cleanliness For freeing the young cattle of the vermin you say that they are tormented with, boil some tobacco so as to make a pretty strong decoction of it, and have them washed once a day with it till they become thoroughly cleaned of them, but a few washings will suffice to do this if properly done." (H.B.Co., B. 200. b. 14, p.4142). There were cattle kept as far north as Fort Norman where Richardson and Rae obtained milk for breakfast in 1849. (Richardson, 1852, p.116). The ranching and dairying activities of the Company did gradually decline when natural increase could not keep up with toll taken by a harsh environment. Horses brought in to do the draft work died and cattle replaced them. (H.B.Co. B. 200. b. 19, p.61).

Throughout most of this early period the fur posts were almost entirely dependent upon food from local sources. The bulk of diet was made up of meat, fish and vegetables from their own gardens. Certain luxuries were, however, brought in from the outside. Tea, coffee, sugar and a few spices gradually became

part of the trade goods brought from the Bay but were in limited supply and used almost exclusively at the forts. Modest quantities of flour were also imported when the attempts to cultivate grain met with indifferent success. Apart from the luxuries mentioned and a supply of "medicinal spirits" the fare of the white man in the Mackenzie region was very little different from his native counterpart.

Fuel.

During the winters in the district there was a great need for fuel wood. The Indians solved this problem by building their lodges where wood was available, but the fur posts were permanent. Gradually the men from the posts had farther and farther to go to collect fuel. The local supply of trees suitable for lumber were cut back even faster than the fuel wood, and as the need for lumber increased with the expansion of the fur trade posts, lumber supply was critical at times. At the northern posts the trees of lumber size were never numerous and as they were cut out, the lumber supply was drawn from the southern posts. In this way a sort of regional specialty grew up with the tall trees of the Liard posts and from Big Island cut and sawn into lumber for other places. The business of wood gathering was almost always carried on throughout the winter. Fuel for cooking was necessary at all times, but heating by wood fire increased winter consumption. Besides, logs were moved out of the bush more easily when they could be sledded on snow or dragged on sleds.

Other winter activity meant attending to small chores about the posts like hauling ice for water, clearing snow and disposing

of refuse. The larger posts like Fort Simpson had trained men to work at special jobs. The smith at his forge would repair axes and chisels, fashion all manner of ironwork including the building of steel traps. These activities contributed to the supply of trade goods which could be bartered for furs. Winter activity was severely restricted by the cold temperatures and limited work to the most active type in order to keep warm. Also the period of low sun made an effective working day quite a short one.

Trading.

The spring and autumn seasons were the ones in which the Indians were the most active in hunting and trapping. Accordingly, at the ends of these seasons, much of the actual fur trading took place. In some of the posts it was difficult to coordinate the trading activities with the packing of furs for shipping. The system of transportation that sustained the fur trade in the earlier days of the North West Company meant that the furs would have to leave the Mackenzie and Athabaska posts in time to reach Fort Chipewyan and return to the Mackenzie district before freeze-up. It was no hardship to accomplish this return journey of 2000 miles from Fort Good Hope in a single open season when the rate of travel varied from 25 - 30 miles per day. The spring hunt could be properly packed and sent out that same summer. When the North West Company merged with the Hudson's Bay Company the supply routes to the fur country were no longer through Montreal but via York Factory in Hudson's Bay. The overall route from London to the Mackenzie district was shortened

considerably by this move and allowed for a readjustment of the transportation. Instead of Fort Chipewyan remaining as a depot and relay point, this function shifted to the height of land at Portage la Loche. Thus, the people from the Mackenzie River travelled to the Portage where they met the brigades with trade goods coming from Norway House on Lake Winnipeg. At the portage the groups exchanged cargoes and returned to their respective districts. (Innis, 1956, p.291). The journey from Fort Good Hope to Fort Chipewyan, about 1000 miles was lengthened by an additional 300 miles to Portage la Loche. The round trip was increased from 2000 miles to about 2600 miles. This in itself is not much longer for perhaps another 24 days travelling time was involved. The extra time had the effect, however, of shortening the number of days of open season at either end of the actual travel period and, therefore, increasing the hazards of an incomplete round trip caused by late break-up, early freeze-up, or a combination, plus delays by bad weather and ice conditions on Great Slave Lake. With such restricting conditions there was careful planning and execution of transportation of furs and goods in the Mackenzie District.

When the Mackenzie River became safe for travel after the spring break-up, canoes left Fort Simpson and travelled to the mouth of the river where the Yukon furs had been deposited at Fort MacPherson then returned to Simpson collecting the district returns from Good Hope and Norman on the way. The northern posts had to be prompt about having their furs sorted, packaged into the usual 90 lb. packets. The Liard posts also brought their returns

to Fort Simpson where the furs from the entire Mackenzie District were assembled and prepared for the journey to Portage la Loche. The brigade required some three weeks to reach the portage and usually arrived at that place about the end of July. With a week or so to exchange goods, make the 13 mile portage and dispatch correspondence, the brigade was ready to return in early August. Trade goods would arrive at Fort Simpson in early September where they had to be unpacked, checked and reassembled in the appropriate bundles for the trade posts up the Liard and down the Mackenzie. Usually these posts waited until late September or early October for the new outfit. The Yukon posts and remote Liard posts like Frances Lake, which required a round trip of 60-65 days from Fort Simpson, were not supplied until the following year. (H.B.Co., B. 200. b. 30, p.96).

Travel

Apart from their explorations, the fur traders did not depart from the established routes of trade. Some of the more energetic men were curious about the surrounding country and made local excursions but most were content to learn these details by questioning the natives. As much of the important travel as possible was conducted during summer and when the large canoes and boats could make the exchanges of goods, furs, records, letters and men all necessary for a successful commercial operation. The large boats, not unlike those used on the Saskatchewan were introduced on the Mackenzie River soon after the Hudson's Bay Company took over control of the area, and the uninterrupted

flow of the river for over 1000 miles saw these craft propelled by current, oars, sail and two-lines become the first large bulk carriers in the northwest. Canoes continued to be used for fast journeys and communication. In winter dog-teams and toboggans followed the frozen water-routes with occasional overland short-cuts whenever emergencies required the movement of personnel and supplies. Usually once, and perhaps twice, during winter the "Express" dog-team visited all the posts in the district and carried important messages and reports south to Fort Chipewyan for communication to the main depot at York Factory in Hudson's Bay. Travel in winter, however, never was as extensive as during summer.

Other Activities.

Periodically work which was not part of the seasonal routine at the posts would be required. For example, the buildings needed repairs, or as in the case of Fort Good Hope in 1836, the entire post had to be relocated and completely rebuilt. For various reasons Fort Norman migrated from place to place in the mid 1800's always involving new construction. Construction work, building repair, boat building, stockade and fence mending were all jobs that continually cropped up, but could be fitted into the least busy part of the summer routine. Winter was too inclement to allow such activity to take place then. Life on a trading post never allowed for much idle time, although the pitch of activity followed the sun; short winter daylight restricted work time, but summer allowed long tiring days.

The fur traders carried into the northwest their strong religious convictions and they did not fail, even in a region so remote from the established symbols of the Christian church, to keep regular religious observances. Sundays at the posts were days of rest, except for chores, and were usually marked by Bible readings or prayers, or both. The Canadians in the country, mostly all of Roman Catholic faith, were permitted to observe many religious holidays even though the chief men at the post was likely a Scots Presbyterian. Although these men kept and practised their own faith, there is no evidence that they tried to persuade the natives towards adopting Christianity. Some men married native wives, and these were instructed in religion by their husbands.

The Christian festivals, particularly Christmas, were times of celebration among the whites, and such occasions were usually marked with an extra tot of grog, feasting and merriment punctuated by the discharge of firearms into the sky. Generally there were too few people at any of the posts along the Mackenzie to provide a crowd of whites large enough for a thorough-going party. But there was often music of both the pipes and fiddle to which whites and Indians stepped lively in their own particular version of jigs and reels. The advent of the New Year called for a generous celebration and reports of good parties followed by a day of rest are to be found recorded in the post journals. Likewise, when the furs had been dispatched and the trade goods repacked and distributed to the various posts, there was time for relaxation and time to contemplate the coming winter.

SUMMARY AND CONCLUSION

During the century between 1750 and 1850 the face of the land of the Mackenzie basin experienced almost no change. If an observer were able, at the beginning of the century, to capture a complete image of the physical geography of this wide area, and if he were able to return at the end of the hundred years, it would be like meeting an old friend to whom the intervening years had been extraordinarily kind. The western mountains formed, in the main, by folded and sometimes faulted sedimentary rocks still display their resistant peaks, and exhibit a ruggedness caused by glacier sculpturing that is so typical of most of the Cordilleran chain. Within and around the edges of these mountains, the plateaux uplands and smooth plains remain quite the same as when first they were found and described by the vanguard of European civilization. East of the sentinel ranges of the Franklin Mountains that flank the edge of the mountain province stretches the wide Interior Plain. In places it is scrubbed bare by Pleistocene ice to expose low, rocky knolls, or high, broad mesas and plateaux; elsewhere this lowland is covered with both ground moraine and the fluvio-glacial products of the wasting ice sheets. These recent geologic events not only provided the materials for the surface of the plain, but they gave expression to the topography particularly in the form of thousands of lakes and large abandoned meltwater channels that exist today unaltered through historic time. Man has made few of those changes which in southern Canada turned meltwater channels into canals, pitted kame moraines with sand and gravel into quarries, probed passes with railways, and gouged out the sides of mountains for building mills and towns.

Over almost all, lies the evergreen mantle of boreal forest. At first glance monotonously regular in its composition, on closer examination, it shows considerable variety with groves of deciduous trees in favoured locations, while the tree cover itself is broken by patches of bog and mossy meadow. Mountain summits rise through and above the forests to appear bare except when alpine shrubs, flowers and grasses flourish during a brief summer season of life. Likewise, the tundra belt, on the northern edge of the forest reaching to the sea, responds in growth during the period of high sun, but withdraws into dormancy to survive the Arctic winter. The coming of the whites has led to some cutting and burning, but it is so insignificant that no material part of this picture of the physical environment is different as a result of the historic events which occurred in the century prior to 1850.

Annually the land of the Mackenzie Valley submits to the changes of the seasons that pass from the deep cold, dark and quiet northern winter with its accumulating snow into the melting warmth as the sun rises higher in the sky, until eventually constant or nearly constant daylight facilitates the seeming urgency with which both animal and vegetative life react. Then, as if exhausted by a short summer of very long days, the life of the region, having accomplished its task of reproduction and preservation, prepares once again to withstand the onslaught of winter. The transition seasons are most spectacular in their passage. Spring sees almost all the rivers and lakes swollen by melting snows and the sound of running water is everywhere in the woods. Great rivers flush themselves free of ice and recede; lakes, aided by wind, break up and receive the flocks of migrating

waterfowl in their flight to the forest fringe and the tundra breeding grounds. The forest animals that do not brave winter in the open, emerge, and migrating bands of caribou follow their favourite paths to the grazing lands on the tundra. The autumn activity is a reversal of the spring regime; birds with their young head south, caribou return to the trees, certain other mammals prepare to hibernate, and many of the deciduous shrubs and trees don the colourful autumn dress before the leaves finally fall. Across this seemingly unchanging landscape flows the Mackenzie River sustained by vigorous tributaries from the mountains, and by larger, quieter-flowing streams from the plain. This artery of the region invited the course of history which it soon experienced.

A yearning for discovery and a spirit of adventure was instilled in Alexander Mackenzie during a short period when this young man traded furs in the company of the wise and experienced traveller, Peter Pond. In 1789, with Mackenzie's exploration of his river, the commercial network of the fur trade spread into new and profitable lands. It was not altogether unheralded; the middlemen trade with other Indians, the northward displacement of native people by Cree Indians possessing firearms, and smallpox all reached the Mackenzie Valley before white men. Local natives, living harmoniously within their environment were met along the river by whites who cleared ground and built their trading posts. They were introduced to trinkets and iron tools. They quickly learned the use of that most marvellous instrument, the gun, and developed an addiction to tobacco. The traders, especially during the period of competition between the North West Company and the X.Y. Company, multiplied their facilities

and became generous in their dealings in order to attract support from the Indians. Later, when control of trade passed to the Hudson's Bay Company and the whole of the northwest was governed by one authority, some retrenchment tightened the hold of the whites over the native people and an efficient business-like organization smoothed the commercial fur trading venture. Part of this efficiency was manifest in exploration. Men like the McLeods, Robert Campbell, and John Bell, resourceful and loyal employees of the Company, brought white contact to the unknown tribes inhabiting the valleys and plains in the western mountains. They added to the geographic knowledge of the region by discovering the pattern of the western Mackenzie - Liard drainage and its relation to the great Yukon River.

In contrast to the lesser known explorations that were tributary to an expanding fur trade, there were expeditions, some publicly sponsored and supported, that aimed at adding unknown geographic features to that part of the map of North America which remained blank. Franklin and Richardson succeeded in placing thousands of miles of uncharted shoreline on paper. Dease and Simpson completed the mapping of the coast of the Yukon Territory and Alaska, and later, Richardson and Rae extended the coastal survey east of the Mackenzie region. The wide search for Sir John Franklin brought Lt. Pullen to the district, and like all those who had gone before, he drew on the resources and local knowledge in the Mackenzie Valley for the success of his expedition. These events had only temporary effect upon the native people at the time of the explorations, but when published accounts were made available, they brought a wider interest and understanding of the geography of this northern land and remain today

as authoritative sources for an image of the country as it then was.

Although an observer viewing the Mackenzie Valley in 1750 and returning in 1850 would find its physical geography the same, he would most certainly record considerable change in its human geography. At the beginning of the century the Indians satisfied every want from the land, and indeed, these wants were adjusted to what the environment could provide or necessitated. The cold, northern climate required shelter, clothing and fire. The natural forests readily supplied wood for fuel, and the area of forest was so vast that the small population of natives could never really make a visible impression on this growth. The need for fuel, however, linked the habitat of the Indians firmly to the wooded land except when, lured by migrating caribou, small excursions were made short distances on to the tundra barrens. From the forests, also, most natives gathered brush and boughs to make their tipins or lodges. Because wood was so plentiful, it was easy to abandon the shelter of a camp-site in favour of removing to another locality as dictated by migrating game or better fishing. The use of wood facilitated these movements; in winter, natives made toboggans to haul over the snow, and in summer, they built canoes to travel along their water routes. Implements like spears, handles, containers, nets and some rope all were products of the forest and native skill.

Practically all other native wants were satisfied from the faunal world. The large mammals like moose, caribou, deer, sheep, and in the earlier days bison, were much hunted because their meat was a mainstay of diet, and their hides could be used for clothing. The Indians devised many hunting methods adapted to the peculiar habits

of these animals by which they were outwitted and slaughtered. Snares, corrals, dead-fall traps, bows and arrows, spears were all employed, and, considerable stealth, persistent tracking, overtaking on snow-shoes, and even mimicry of animal behaviour became part of the lore of every Indian hunter. The skins of the large mammals, with the hair on for winter, and without hair in summer, were made into clothing by the womenfolk. Dress consisted of a long shirt, leggings, and breech-cloth. They made skin moccasins for shoes, and in winter, added head-covering of some form, donned mittens, and wrapped over all, they carried a skin robe. Some of the clothes were decorated with fringe and needlework. Certain Indians, mainly the Hare people, found that it was easy to catch sufficient numbers of rabbits to supply them with meat, and the skins were woven into a kind of blanket from which the women made clothes. Animal bones, teeth, sinew and hides were the raw materials from which the Indians fashioned their weapons, ropes and threads, and a host of other things that they used daily at their campsites or out on the trail. It will be remembered, too, that native diet was in a large measure based upon fish. Especially in summer, but locally in winter too, the people gathered at known fishing areas to reap the annual harvest with their nets and lines. Often being stationed at the water's edge, the hunters could capture waterfowl during their migration or nesting activities.

The description of the fauna has shown that each animal type prefers special localities and follows its own pattern of living. Thus to gain their own livelihood, the Indians were forced to move from one source of food to another. They understood and pursued the

wandering caribou; at certain seasons they moved to await the spawning fish or migrating birds; and in other seasons, they were forced to camp and wait out the break-up and freeze-up seasons. Essentially, then, the Indian life was a mobile one, not so much because man himself had to respond to nature's rhythm, but because the game upon which he depended was in close harmony with the environment. Just as the moving game demanded a wandering native existence, so the benefits of their forested domain permitted it to take place.

In 1850 after the fur trade was well established, and the system of trade had seduced all the Indians in the Mackenzie Valley, the human geography of the region was very different from the prehistoric period. White men, when introducing trade, offered some items which were calculated to fascinate the people and offer pleasure. Beads and coloured cloth were among them. Still other goods were designed to become needy through addiction - tobacco and spirits especially. Liquor, in fact, was rare in the Mackenzie Valley and never really gained a hold on the inhabitants before the traders realized that there were too many disadvantages to trading rum. Finally, the trade offered useful items like iron tools, steel traps, knives, guns and European cloth to the Indians. In return, the natives gathered fur pelts, particularly beaver and marten, which seemed to be there for the taking. Before the trade, these smaller mammals were of no consequence to the aborigines except as pests, or symptoms of the behaviour of nature, or subjects of their many legends. Now they were valuable as a means of gaining the pleasures and easier life held out by the whites.

Of all the elements of the natural environment the fauna were

most affected by the incursion of European culture. Animals which were not the natural prey of men became hunted assiduously and the equilibrium of animal populations changed. Beavers, for instance, became very scarce, so much so that for a time trade of their skins was actively discouraged. Local fur supplies were depleted by over-hunting, and the post managers were always trying to encourage their hunters to explore new grounds. In some seasons the commercial returns of the Mackenzie district became alarmingly low, with the result that the region was abandoned altogether for a short period. Still, trade and white enterprise along with growing native adaptation kept the operations going without driving the animals into extinction.

The goods introduced by Europeans greatly eased the life of the aborigines, and because they quickly realized this, trade was almost immediately accepted in the country. Labour devoted to the manufacture of tools, weapons and clothes was diverted to harvesting furs, at first an easy task. The introduction of metal pots alone greatly eased the cooking and carrying problems of the Indian wife and she was liberated to prepare hides, and decorate clothes. In this way the people came to possess and need superior equipment for their existence. They had still, of course, to hunt for food but even this was easier with guns. It was possible to move with the game and engage in trapping at the same time so that the seasonality of Indian life was not greatly modified. Perhaps most affected were the activities of spring and autumn. Principally at this time, the natives made their way to the forts for trade and also trapping tended to be more intense especially after receiving fresh supplies of powder and balls. Later in the century when far away markets

demanded higher quality furs, summer trapping was discouraged and winter activity encouraged.

Part of the new landscape were the forts of the trading companies, some of which had been abandoned and plundered by the natives. Those that were maintained were surrounded by an increasing area of cut and cleared forests as the whites gathered their fuel and prepared ground for their gardens and small farms. New, too, were the large boats that moved along the Mackenzie highway distributing goods and returning the furs to the south on the way overseas.

Some unforeseen and unfortunate side effects came with the whites, particularly disease. The natives were quite unprepared physically for smallpox, influenza and measles, and epidemics took fearful tolls. The major difference that developed in the Indian way of life, however, was the loss of independence. Formerly these people lived in a self-contained world from which they satisfied their needs and desires, and their standards of success were measured within the environmental limitations. One may presume that in spite of hardships, which were frequent, men experienced both contentment and pleasure. When the whites came, they found the Indians primitive, and the natives themselves recognized the superiority of the newcomers from the goods that were offered in trade. A desire to better their own positions caused the natives to join their destinies to the trading post. In so doing, they moved beyond their own environment for at least part of their new way of life, and, when the old tools and techniques disappeared from memory, they had once and for all surrendered their freedom. It may be that the new dependent life was never compatible with the centuries of proud mastery over the land that the Indian

race had experienced, which would help explain the uncertain and erratic progress they have made towards adopting completely the ways of the whites. By 1850 the transition was only partly accomplished, and for good or ill, the subsequent century brought changes destined to erase almost entirely the geography of the past.

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